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The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

THE OFFICIAL GAZETTE (PATENT SECTION), issued weekly.

THE OFFICIAL GAZETTE (TRADEMARK SECTION), issued weekly.

GENERAL INFORMATION concerning PATENTS.

GENERAL INFORMATION concerning TRADEMARKS.

PRINTED COPIES OF PATENTS are furnished by the Patent and Trademark Office at $1.00 each; PLANT PATENTS in color, $8.00 each; copies of TRADEMARKS at $1.00 each. Address orders to the Commissioner of Patents and Trademarks, Washington, D.C., 20231.

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1042 O.G. 45 on May 15, 1984.

For use of the European Patent Office as a Searching Authority for PCT applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

Domestic PCT fees were increased on Oct. 1, 1982 by a rule change to 37 CFR 1.445 that was published in the *Official Gazette* at 1021 O.G. 11 on Aug. 10, 1982.

The Search fee for the European Patent Office was changed as of Feb. 14, 1984 and was announced in the *Official Gazette* at 1039 O.G. 142 on Feb. 21, 1984.

International PCT fees were changed by the PCT Assembly effective Jan. 1, 1984 and were announced in the *Official Gazette* at 1037 O.G. 12 on Dec. 13, 1983.

The current schedule of PCT fees is as follows:

Transmittal fee	$ 125.00
Search fee	
U.S. Patent and Trademark Office as Searching Authority	
· No corresponding prior U.S. national application filed	500.00
· Corresponding prior U.S. national application filed	250.00
European Patent Office as Searching Authority	
· All cases	620.00
International Fees	
Basic fee (first 30 pages)	295.00
Basic Supplemental fee (for each page over 30)	6.00
Designation fee (for each national or regional office)	70.00

Apr. 13, 1984.

GERALD J. MOSSINGHOFF,
Commissioner of Patents and Trademarks.

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

3,965,600, Re. S.N. 579,256, Filed Feb. 13, 1984, Cl. 40/152.1, FRAME HANGER, Wayne H. Paskerian, Owner of Record: *M. W. Carr & Co., West Somerville, Mass.*, Attorney or Agent: James B. Lampert, Ex. Gp.: 333

4,313,912, Re. S.N. 574,802, Filed Jan. 30, 1984, Cl. 422/267, APPARATUS FOR THE CONTINUOUS EXTRACTION OF OILS AND SOLUBLE SUBSTANCES FROM SOLID MATERIALS, William M. Barger, Owner of Record: *French Oil Mill Machinery Co., Piqua, Ohio,* Attorney or Agent: Nathaniel R. French, et al., Ex. Gp.: 177

4,314,665, Re. S.N. 588,049, Filed Mar. 9, 1984, Cl. 236/46, ELECTRONIC THERMOSTAT, Michael R. Levine, Owner of Record: *Inventor,* Attorney or Agent: Allen M. Krass, et al., Ex. Gp.: 344

4,320,893, Re. S.N. 588,152, Filed Mar. 9, 1984, Cl. 271/94, TRANSPORT APPARATUS FOR TRANSPORTING FLEXIBLE SHEET-LIKE ARTICLES, Martin Blumle, Owner of Record: *Winkler & Dunnebier Maschinen Fabrik und Eisengiesserei GmbH & Co., ke Neuwied, Germany,* Attorney or Agent: Werner W. Kleeman, et al., Ex. Gp.: 312

4,322,080, Re. S.N. 580,447, Filed Feb. 15, 1984, Cl. 273/86B, IMAGE PROJECTING AMUSEMENT DEVICE, Hugh S. Pennington, Owner of Record: *David R. Capasso, Killingworth, Conn.*, Attorney or Agent: Joseph M. Fitzpatrick, et al., Ex. Gp.: 334

4,369,912, Re. S.N. 580,059, Filed Feb. 14, 1984, Cl. 229/5.6, COMPOSITE CAN WITH COMPRESSED END TO PROVIDE EASY OPENING, Harold D. Abner, Owner of Record: *Proctor & Gamble Co., Cincinnati, Ohio,* Attorney or Agent: Richard C. White, et al., Ex. Gp.: 241

4,378,484, Re. S.N. 581,197, Filed Feb. 17, 1984, Cl. 219/203, AUTOMOTIVE WINDSHIELD, Heinz Kunert, Owner of Record: *Vereinigte Glaswerke GmbH, Aachen, Germany,* Attorney or Agent: Stanton T. Lawrence, Jr., Ex. Gp.: 242

4,382,301, Re. S.N. 575,296, Filed Jan. 30, 1984, Cl. 2/22, SNAKE PROOF CHAPS, George H. Hightower, Jr., Owner of Record: *Thomaston Mills, Inc., Thomaston, Ga.*, Attorney or Agent: Harold L. Stowell, et al., Ex. Gp.: 353

4,386,908, Re. S.N. 579,359, Filed Feb. 13, 1984, Cl. 433/9, LINGUAL ORTHODONTIC APPLIANCE SYSTEM, Craven H. Kurz, Owner of Record: *Inventor,* Attorney or Agent: Keith D. Beecher, Ex. Gp.: 333

4,396,959, Re. S.N. 596,438, Filed Apr. 3, 1984, Cl. 360/77, DATA TRANSDUCER POSITION CONTROL SYSTEM FOR ROTATING DISK DATA STORAGE EQUIPMENT, Joel N. Harrison, et al., Owner of Record: *Quantum Corp., San Jose, Calif.,* Attorney or Agent: James W. Geriak, et al., Ex. Gp.: 235

4,414,463, Re. S.N. 579,441, Filed Feb. 13, 1984, Cl. 219/270, GLOW-PLUG, John T. Petrik, et al., Owner of Record: *Sun Chemical Corp., New York, N.Y.,* Attorney or Agent: Cynthia Berlow, et al., Ex. Gp.: 213

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.21(b)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

3,854,664, Reexam. No. 90/000,542, Requested: Apr. 16, 1984, Cl. 239/206, SPRINKLER SYSTEM, Edwin J. Hunter, Owner of Record: *Toro Manufacturing Corp., Riverside, Calif.,* Attorney or Agent: James W. Miller, Ex. Gp.: 310, Requester: Owner

3,906,134, Reexam. No. 90/000,537, Requested: Apr. 4, 1984, WELDABILITY OF ARTICLES MADE FROM PLASTIC FOAMS, Gerhard Pohl, Owner of Record: *Zwissler Ulrich, Gerstetten, Germany,* Attorney or Agent: Richard L. Johnston, Ex. Gp.: 150, Requester: Asahi Kasei Kogyo Kabushiki, Washington, D.C.

4,167,585, Reexam. No. 90/000,545, Requested: Apr. 18, 1984, Cl. 426/233, METHOD FOR HEATING AND COOLING FOODS IN A CLOSED TREATMENT CHAMBER BY MAINTAINING THETEMPERATURE AND MOISTURE CONTENT, Andrew

A. Caridis, et al., Owner of Record: *Heat and Control, Inc., San Francisco, Calif.*, Attorney or Agent: Flehr, Hohbach, et al., Ex. Gp.: 130, Requester: Stein Associates, Inc., Sandusky, Ohio

4,182,759, Reexam. No. 90/000,546, Requested: Apr. 18, 1984, Cl. 424/217, ARYLALKYL AND ARYLOXYALKYL PHOSPHONATES AND USE AS ANTIVIRAL AGENTS, Guy D. Diana, Owner of Record: *Sterling Drug, Inc., New York, N.Y.*, Attorney or Agent: B. Woodrow Wyatt, Ex. Gp.: 122, Requester: Owner

4,302,162, Reexam. No. 90/000,543, Requested: Apr. 17, 1984, Cl. 417/44, WATER PUMPING DEVICE, Jefferson J. Springston, Owner of Record: *Power House, Inc., Baltimore, Md.*, Attorney or Agent: LeBlanc, Nolan, et al., Ex. Gp.: 340, Requester: Offshore Horizons, Inc., New York, N.Y.

4,342,811, Reexam. No. 90/000,538, Requested: Apr. 9, 1984, Cl. 428/220, OPEN-CELLED MICROPOROUS SORBENT-LOADED TEXTILE FIBERS AND FILMS AND METHODS FABRICATING SAME, George Lopatin, et al., Owner of Record: *Albany International Corp., Albany, N.Y.*, Attorney or Agent: Kenway & Jenney, Ex. Gp.: 154, Requester: Owner

4,355,032, Reexam. No. 90/000,541, Requested: Apr. 9, 1984, Cl. 424/253, 9-(1,3-DIHYDROXY-2-PROPOXIMETHYL)-GUANINE AS ANTIVIRAL AGENT, Julien P. Verbeyden, Owner of Record: *Syntex (USA), Inc., Palo Alto, Calif.*, Attorney or Agent: Alan M. Krubiner & Annette M. Moore, Ex. Gp.: 120, Requester: Howard J. Schaeffer, Raleigh, N.C.

4,357,256, Reexam. No. 90/000,547, Requested: Apr. 20, 1984, Cl. 252/188.24, SODIUM HYDROSULFITE COMPOSITION, Takaaki Yamaguchi, Owner of Record: *Mitsubishi Gas Chemical Co., Inc., Tokyo, Japan*, Attorney or Agent: R. Eugene Varndell, Ex. Gp.: 157, Requester: Morton Thiokol, Inc., Chicago, Ill.

4,365,692, Reexam. No. 90/000,539, Requested: Apr. 11, 1984, Cl. 187/8.72, ELEVATING CATWALK, Gary W. Craig, Owner of Record: *Loffland Brothers Co., Tulsa, Okla.*, Attorney or Agent: Head, Johnson & Stevenson, Ex. Gp.: 310, Requester: Mid-Western Energy Corp., Yukon, Okla.

4,393,911, Reexam. No. 90/000,540, Requested: Apr. 9, 1984, Cl. 152/158, SAFETY LINER FOR TIRES, Mason C. Winfield, Owner of Record: *Astronics Corp., Orchard Park, N.Y.*, Attorney or Agent: Schlesinger, Fitzsimmons & Schlesinger, Ex. Gp.: 130, Requester: Theodore C. Patecell, Flushing, N.Y.

4,415,355, Reexam. No. 90/000,536, Requested: Mar. 29, 1984, Cl. 71/121, DINITROANILINE HERBICIDAL COMPOSITIONS CONTAINING FREEZING POINT DEPRESSANT ADDITIONS, Ronald L. Cassell, et al., Owner of Record: *BASF Wyandotte Corp., Wyandotte, Mich.*, Attorney or Agent: David L. Hedden, Ex. Gp.: 120, Requester: Eli Lilly Co., Indianapolis, Ind.

Erratum

"All reference to Patent No. 4,443,391, to Bernd Melchior of Germany for 'PROCESS OF MAKING ARTICLES OF FOAMED POLYMETHYL METHACRYLATE' appearing in the Official Gazette of Apr. 17, 1984 should be deleted since no patent was granted."

PATENT NOTICES

Certificates of Correction for the Week of May 22, 1984

3,931,583	4,406,814	4,424,941	4,432,050
4,017,290	4,407,133	4,425,548	4,432,344
4,021,253	4,407,296	4,425,657	4,432,629
4,201,444	4,407,648	4,426,144	4,432,708
4,217,932	4,408,075	4,426,306	4,432,899
4,290,937	4,409,053	4,426,494	4,433,257
4,323,636	4,409,110	4,426,877	4,433,442
4,327,179	4,409,687	4,426,945	4,433,566
4,338,102	4,410,638	4,427,841	4,433,597
4,339,945	4,414,296	4,428,150	4,434,174
4,351,858	4,414,877	4,428,527	4,434,325
4,363,890	4,415,690	4,428,671	4,434,506
4,366,505	4,415,712	4,428,775	4,434,553
4,367,435	4,415,934	4,428,816	4,434,580
4,374,612	4,416,014	4,429,554	4,434,609
4,375,513	4,416,839	4,429,859	4,434,674
4,377,613	4,417,126	4,429,997	4,434,722
4,378,809	4,417,786	4,430,698	4,434,772
4,378,949	4,418,076	4,430,738	4,434,805
4,380,597	4,418,776	4,430,876	4,434,864
4,381,335	4,419,462	4,430,922	4,435,119
4,385,604	4,419,917	4,430,961	4,435,252
4,386,194	4,419,986	4,430,962	4,435,326
4,388,329	4,420,247	4,431,016	4,435,400
4,388,356	4,421,035	4,431,140	4,435,435
4,392,135	4,421,341	4,431,155	4,435,467
4,392,741	4,421,588	4,431,386	4,435,489
4,392,997	4,422,434	4,431,480	4,435,797
4,396,728	4,422,606	4,431,520	4,435,806
4,397,099	4,423,388	4,431,588	4,435,866
4,400,519	4,423,413	4,431,647	4,435,933
4,400,688	4,423,430	4,431,798	4,436,546
4,403,220	4,423,795	4,431,831	4,439,782
4,405,538	4,423,939	4,431,971	

Disclaimers

4,224,579.—*Calvin Jon Marlett,* La Crescenta; *Edwin A. Reed,* Upland; *Richard C. Johnson* and *William F. Hug,* Pasadena, Calif. METAL VAPOR LASER DISCHARGE TUBE. Patent dated Sept. 23, 1980. Disclaimer filed Apr. 2, 1984, by the assignee, *Xerox Corp.*

Hereby enters this disclaimer to claims 1–3 of said patent.

4,303,310.—*Hiroshi Morita,* Tokyo and *Hiroshi Washida,* Yokohama, Japan. ELECTROCHROMIC DISPLAY DEVICE. Patent dated Dec. 1, 1981. Disclaimer filed Apr. 9, 1984, by the assignee, *Tokyo Shibaura Denki Kabushiki Kaisha.*

Hereby enters this disclaimer to claim 1 of said patent.

4,390,676.—*Samuel Loshaek,* Chicago, Ill. ULTRAVIOLET ABSORBING LENSES. Patent dated June 28, 1983. Disclaimer filed Apr. 5, 1984, by the assignee, *Schering Corp.*

Hereby enters this disclaimer to claims 5, 6, 7 and 8 of said patent.

Dedications

3,970,530.—*Bohdan Maslowski; Dimitri Tzanos,* Geneva, Switzerland. METHOD OF AND SYSTEM FOR THE DESTRUCTION AND/OR LIMITATION OF THE REPRODUCTION OF MICRO-ORGANISMS IN NUTRITIVE MEDIA. Patent dated July 20, 1976. Dedication filed Mar. 26, 1984, by the assignee, *Battelle Memorial Institute.*

Hereby dedicates to the People of the United States the entire remaining term of said patent.

3,996,001.—*Manuel Sanz,* Grand-Lancy and *Georges Revillet,* Onex, Switzerland. METHOD OF AND DEVICE FOR THE ANALYSIS OF LIQUIDS. Patent dated Dec. 7, 1976. Dedication filed Mar. 26, 1984, by the assignee, *Battelle Memorial Institute.*

Hereby dedicates to the People of the United States the entire remaining term of said patent.

3,998,428.—*Erwin Zurcher,* Geneva, Switzerland. PROCESS AND APPARATUS FOR CONTINUOUSLY MEASURING THE VALUE OF THE TENSION IN A FILAMENT BEING DISPLACED FROM ONE POINT TO ANOTHER. Patent dated Dec. 28, 1976. Dedication filed Mar. 26, 1984, by the assignee, *Battelle Memorial Institute.*

Hereby dedicates to the People of the United States the entire remaining term of said patent.

4,034,567.—*Rolf Roggen,* Grand-Lancy, Switzerland. SELF-DRILLING THERMAL BOLT. Patent dated July 12, 1977. Dedication filed Mar. 26, 1984, by the assignee, *Battelle Memorial Institute.*

Hereby dedicates to the People of the United States the entire remaining term of said patent.

4,057,097.—*Benno Lux,* Veyrier; *Wilfried Kurz,* Lausanne, both of Switzerland; *Jean-Claude Hubert,* Saint-Maur; *Francois Mollard,* Gaillard, both of France and *Guido Walt,* Geneva, Switzerland. CASTING PROCESS WITH INSTANEOUS UNIDIRECTIONAL SOLIDIFICATION. Patent dated Nov. 8, 1977. Disclaimer filed Mar. 26, 1984, by the assignee, *Battelle Memorial Institute.*

Hereby dedicates to the People of the United States the entire remaining term of said patent.

4,083,360.—*Jean-Claude F. Courvoisier* and *Jean-Luc CH. Meylan,* Geneva, Switzerland. DEVICE FOR COLLECTING SOLAR ENERGY. Patent dated Apr. 11, 1978. Dedication filed Mar. 26, 1984, by the assignee, *Battelle Memorial Institute.*

Hereby dedicates to the People of the United States the entire remaining term of said patent.

4,086,155.—*Pierre Jonville,* Plan-Les-Ouates, Switzerland. ELECTROLYZER WITH RELEASED GAS. Patent dated Apr. 25, 1978. Dedication filed Mar. 26, 1984, by the assignee, *Battelle Memorial Institute.*

Hereby dedicates to the People of the United States the entire remaining term of said patent.

4,089,801.—*Michel Schneider,* Grand Lancy, Switzerland. PROCESS FOR THE PREPARATION OF LIPOSOMES. Patent dated May 16, 1978. Dedication filed Mar. 26, 1984, by the assignee, *Battelle Memorial Institute.*

Hereby dedicates to the People of the United States the entire remaining term of said patent.

4,120,763.—*Frederic Breda* and *Pierre Jonville,* Geneva, Switzerland. HYDROGEN TRANSFER BY METAL HYDRIDE BETWEEN AQUEOUS MEDIUM AND ORGANIC COMPOUND. Patent dated Oct. 17, 1978. Dedication filed Mar. 26, 1984, by the assignee, *Battelle Memorial Institute.*

Hereby dedicates to the People of the United States the entire remaining term of said patent.

Disclaimers and Dedications

4,215,791.—*Wilfred R. Brochman*, Oakland, Minn. EASY OPEN CLOSURE SYSTEM. Patent dated Aug. 5, 1980. Disclaimer and dedication filed Mar. 23, 1984, by the assignee, *Minnesota Mining and Manufacturing Co.*

Hereby disclaims and dedicates to the Public the remaining term of said patent.

4,233,568.—*Randolph W. Hamerdinger* and *Robert C. McQuillan*, Glendora, Calif. LASER TUBE MIRROR ASSEMBLY. Patent dated Nov. 11, 1980. Disclaimer and dedication filed Apr. 2, 1984, by the assignee, *Xerox Corp.*

Hereby disclaims and dedicates the entire term of said patent to the Public.

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The following libraries, designated as Patent Depository Libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent years to all or most of the patents issued since 1790.

These patent collections are open to public use and each of the Patent Depository Libraries, in addition, offers the publications of the U.S. Patent Classification System (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the Patent Depository Libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

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Arizona	Tempe: Science Library, Arizona State University	(602) 965-7140
California	Los Angeles Public L ibrary	(213) 626-7555 Ext. 273
	Sacramento: California State Library	(916) 322-4572
	San Diego Public Library	(619) 236-5813
	Sunnyvale: Patent Information Clearinghouse*	(408) 738-5580
Colorado	Denver Public Library	(303) 571-2122
Delaware	Newark: University of Delaware	(302) 738-2238
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Massachusetts	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Ann Arbor: Engineering Transportation Library, University of Michigan	(313) 764-7494
	Detroit Public Library	(313) 833-1450
Minnesota	Minneapolis Public Library & Information Center	(612) 372-6670
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 390, Ext. 391
Montana	Butte: Montana College of Mineral Science and Technology Library	(406) 496-4283
Nebraska	Lincoln: University of Nebraska-Lincoln, Engineering Library	(402) 472-3411
Nevada	Reno: University of Nevada Library	(702) 784-6579
New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7815
New Mexico	Albuquerque: University of New Mexico Library	(505) 277-5441
New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 930-0850
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
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	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Rhode Island	Providence Public Library	(401) 521-8726
South Carolina	Charleston: Medical University of South Carolina	(803) 792-2372
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 725-8876
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Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3043

All of the above-listed libraries offer CASSIS (Classification And Search Support Information System), which provides direct, on-line access to Patent and Trademark Office data.

*Collection organized by subject matter.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

JAMES E. DENNY, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF April 14, 1984

PATENT EXAMINING GROUPS	Actual Filing Date of Action New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110—D. E. TALBERT, Director	4-08-83
ORGANIC CHEMISTRY AND BIOTECHNOLOGY, GROUP 120—C. E. VAN HORN, Director	9-29-82
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130—R. F. WHITE, Director	9-30-82
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director	3-18-83
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—S. W. ENGLE, Director	3-22-82
SPECIAL LAWS ADMINISTRATION, GROUP 220—K. L. CAGE, Director	6-01-81
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230—E. LEVY, Director	9-24-81
RECEPTACLES, CLEANING, WINDING, AND MEASURING, GROUP 240—G. M. FORLENZA, Director	7-19-82
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250—S. S. MATTHEWS, Director	1-26-81
DESIGN, GROUP 290—K. L. CAGE, Director	1-11-82
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director	3-16-82
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320—S. N. ZAHARNA, Director	6-10-82
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330—R. E. AEGERTER, Director	1-10-82
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—D. J. STOCKING, Director	5-14-82
GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350—A. L. SMITH, Director	10-15-81

Expiration of patents: The patents within the range of numbers indicated below expire during March 1984, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,311,921 to 3,316,555, inclusive

Plant Patents ..... Numbers 2,730 to 2,733 inclusive

REEXAMINATIONS

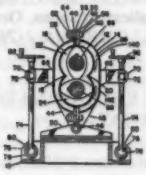
MAY 22, 1984

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 3,195,868 (193rd)
CONTINUOUS MIXER

Bernard A. Loomans, York, and Ambrose K. Brennan, Jr., Thomasville, both of Pa., assignors to Baker Perkins Inc., New York, N.Y.

Reexamination Request No. 90/000,380, May 11, 1983.
Reexamination Certificate for Patent No. 3,195,868, issued Jul. 20, 1965, Ser. No. 181,278, Mar. 21, 1962.
Int. Cl.³ B01F *7/04*
U.S. Cl. 366—85



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–11** is confirmed.

1. A mixer comprising; housing means in the form of parallel intersecting cylinders, axially arranged pairs of radially inter-engaging rotatable members mounted on shafts, extending axially of said cylinders, for rotation therein, each member in cross section having convex flanks joined at both outer ends by arcuate crests formed on radii at least substantially equal to the radius of their associated cylinder, drive means for rotating said members in the same direction, and the flanks of each of said members being substantially generated by portions of the crests of the other member, whereby the crests of each of said members wipes the walls of its associated cylinder and the flanks of each of said members are wiped by portions of the crests of the other member.

B1 3,869,362 (194th)
PROCESS FOR REMOVING NOXIOUS GAS POLLUTANTS FROM EFFLUENT GASES BY IRRADIATION

Sueo Machi, Takasaki; Keita Kawamura, Yokohama; Waichiro Kawakami, Takasaki; Shingi Aoki, Fujisawa; Shoji Hashimoto; Keiichi Yotumoto, both of Takasaki, and Hiromi Sunaga, Isesaki, all of Japan, assignors to Ebara Manufacturing Co., Ltd. and Japan Atomic Energy Research Institute, both of Tokyo, Japan

Reexamination Request No. 90/000,309, Dec. 21, 1982.
Reexamination Certificate for Patent No. 3,869,362, issued Mar. 4, 1975, Ser. No. 431,925, Jan. 9, 1974.
Claims priority, application Japan, Jan. 11, 1973, 48-5607; Jan. 19, 1973, 48-7827; Aug. 15, 1973, 48-91547
Int. Cl.³ B01J *19/12*
U.S. Cl. 204—157.1 R

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

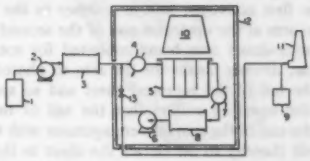
The patentability of claims **1–6** is confirmed.

Claims **8** and **9**, having been finally determined to be unpatentable, are cancelled.

Claim **7** is determined to be patentable as amended:

1. A process for removing NO_x and SO_2 from effluent gases comprising

regulating the ratio of the NO_x content to the SO_2 content so as to be in the region of 0.1–3.0 before the gases are delivered to a reaction chamber inlet,



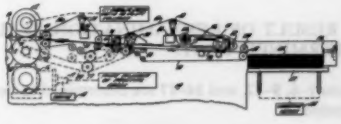
moving said gases through said reaction chamber and at the same time irradiating them with an ionizing radiation or ultraviolet light from a radiation source which is placed near or in said reaction chamber, thereby converting gaseous pollutants including NO_x and SO_2, to mist and/or solid particles, and then

collecting the particles thus produced by a mist and dust collector.

B1 3,994,221 (195th)
SHEETER FOR USE WITH PRINTING PRESS AND ADDING PROVISION FOR ARRESTING, SQUARING AND DIVERTING OF SHEET

F. John Littleton, Effingham, Ill., assignor to World Color Press, Inc., Effingham, Ill.

Reexamination Request No. 90/000,426, Jul. 28, 1983.
Reexamination Certificate for Patent No. 3,994,221, issued Nov. 30, 1976, Ser. No. 618,813, Oct. 2, 1975.
Int. Cl.³ B41F *13/56*
U.S. Cl. 101—227



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–6** and **8** is confirmed.

Claim **7** is determined to be patentable as amended:

1. In a sheeter for receiving a printed web from a printing press at high speed and for feeding sheets in shingled relation to a point of collection, the combination comprising a cutting cylinder, a sheeter drive for rotating the cutting cylinder in rotational synchronism with the plate cylinder of the press, a first conveyor belt coupled to the drive for transporting the cut

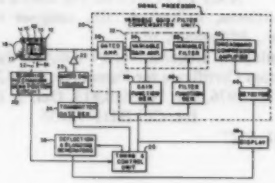
sheets seriatim at high speed, a second conveyor belt having a length exceeding the length of the sheet and arranged at a slightly lower level than the first conveyor belt for receiving a sheet discharged from the latter at high speed, said second conveyor belt having an auxiliary loop of belt longitudinally arranged and spaced a short distance above it, the auxiliary loop of belt having a high speed driving connection with the drive for inducing prompt flow of sheets to the region above the second belt, the second conveyor belt having a plurality of transversely alined, widely spaced squaring rollers adjacent its downstream end, the squaring rollers bearing against the second conveyor belt and, with the second conveyor belt, serving to define a squaring nip for engaging the leading edge of the received sheet to square up the sheet on the second belt and to reduce its forward speed, the squaring rollers being mounted for idle rotation on a common shaft, means coupled to the drive for driving the second conveyor belt at a fraction of the speed of the first conveyor belt, a snubber in the form of a knock-down arm at the upstream end of the second conveyor belt, the knock-down arm being mounted for rotation in a vertical plane, driving means for the arm so phased with the arrival of the tail of the received sheet and so spaced with respect to the squaring rollers that the tail of the sheet is pressed by the end of the arm into engagement with the second conveyor belt thereby to decelerate the sheet to the speed of the second conveyor belt upon engagement of the leading edge of the sheet with the squaring rollers, and means for receiving sheets fed from the second conveyor belt.

B1 4,016,750 (196th)

ULTRASONIC IMAGING METHOD AND APPARATUS

Philip S. Green, Atherton, Calif., assignor to Stanford Research Institute, Menlo Park, Calif.

Reexamination Request No. 90/000,351, Mar. 24, 1983.
Reexamination Certificate for Patent No. 4,016,750, issued Apr. 12, 1977, Ser. No. 629,594, Nov. 6, 1975.
Int. Cl.³ G01N *29/00*
U.S. Cl. 73—629



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **1–6, 9–12,** and **14–17** are determined to be patentable as amended:

Claims **7, 8, 13** and **18,** dependent on amended claims, are determined to be patentable.

New claims **19–20** are added and determined to be patentable.

1. In an ultrasonic system for the examination of the interior of objects, such as body parts, the combination comprising,

means for insonification of an object under examination with a broadband ultrasonic wave signal,

means for receiving echo signals from discontinuities over a range of depths within the insonified object and for converting the same to electrical signals,

means for filtering said electrical signals by bandpass filter means having a **[**filter transmission factor as a function of frequency which is**]** *continuously* variable, *unitary, passband,* and

means for compensating for depth dependent changes in the spectral distribution of the echo signals by time varying **[**the filter transmission factor versus frequency characteristic**]** *said unitary passband* of the bandpass filter means in accordance with the depth of the discontinuity from which the echo signal is reflected *while receiving the echo signals.*

B1 4,065,366 (197th)

PROCESS FOR PRODUCING ALKALI METAL HYDROXIDE

Yoshio Oda; Manabu Suhara, and Eiji Endo, all of Yokohama, Japan, assignors to Asahi Glass Co., Ltd., Tokyo, Japan

Reexamination Request No. 90/000,121, Dec. 3, 1981.
Reexamination Certificate for Patent No. 4,065,366, issued Dec. 27, 1977, Ser. No. 728,017, Sep. 29, 1976.
Claims priority, application Japan, Oct. 17, 1975, 50-124275
Int. Cl.³ C25B *1/16, 1/26, 13/08*
U.S. Cl. 204—98

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–10** is confirmed.

New claims **11–14** are added and determined to be patentable.

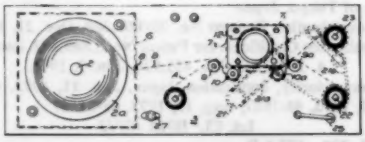
1. In a process for producing an alkali metal hydroxide which comprises electrolysis of an aqueous solution of an alkali metal chloride in an electrolytic cell having an anode compartment and a cathode compartment which are partitioned by a fluorinated cation exchange membrane, the improvement which comprises a fluorinated cation exchange membrane made of a fluorinated copolymer having carboxylic acid groups as the ion exchange group and having an ion exchange capacity of 0.5 to 2.0 meq/g dry polymer and concentration of carboxylic acid groups of 8 to 30 meq/g water absorbed by the membrane when contacted with an aqueous solution of the alkali metal hydroxide having about the same concentration of alkali metal hydroxide as that of catholyte during said electrolysis.

B1 4,265,533 (198th)

APPARATUS FOR THE PRODUCTION OF DUPLICATE, AND OTHER FILMS FROM ORIGINAL FILMS

Robert W. Gasse, 36 Fairfield Dr., Burnley, Lancashire, England

Reexamination Request No. 90/000,444, Sep. 15, 1983.
Reexamination Certificate for Patent No. 4,265,533, issued May 5, 1981, Ser. No. 94,386, Nov. 15, 1979.
Claims priority, application United Kingdom, Nov. 17, 1978, 45127/78
Int. Cl.³ G03B *27/10*
U.S. Cl. 355—110



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–4** is confirmed.

New claim **5** is added and determined to be patentable.

1. Apparatus for the production of duplicate micro and other films from original films comprising a base board, a spindle passing through the base board, a spool containing an original developed film mounted on the spindle, a second spindle, a magazine containing a duplicate film mounted thereon of substantially greater length than the original film, a light tight casing enclosing the magazine, a lamp-house surrounding the casing, a lamp in the lamp-house, a transparent cylinder surrounding the lamp and a slotted opaque sleeve interposed between the lamp and the cylinder, an endless belt passing over the cylinder, means for driving the endless belt, the endless belt maintaining the films in contact on the cylinder, a meter for registering the length of film remaining in the magazine, a sensor for activating the meter and a sensor for stopping the apparatus after the last image on the original film has been exposed.

B1 4,287,739 (199th)

METHOD FOR PRODUCING A HELICALLY WOUND PIPE HAVING A PREDETERMINED DIAMETER

George L. Campbell, Scottsdale, Ariz., assignor to Syracuse Tank & Manufacturing, Phoenix, Ariz.

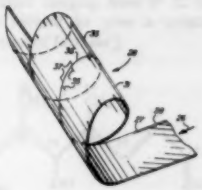
Reexamination Request No. 90/000,417, Jul. 11, 1983.
Reexamination Certificate for Patent No. 4,287,739, issued Sep. 8, 1981, Ser. No. 23,585, Mar. 26, 1979.
Int. Cl.[3] B21C *51/00, 37/12*
U.S. Cl. 72—34

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

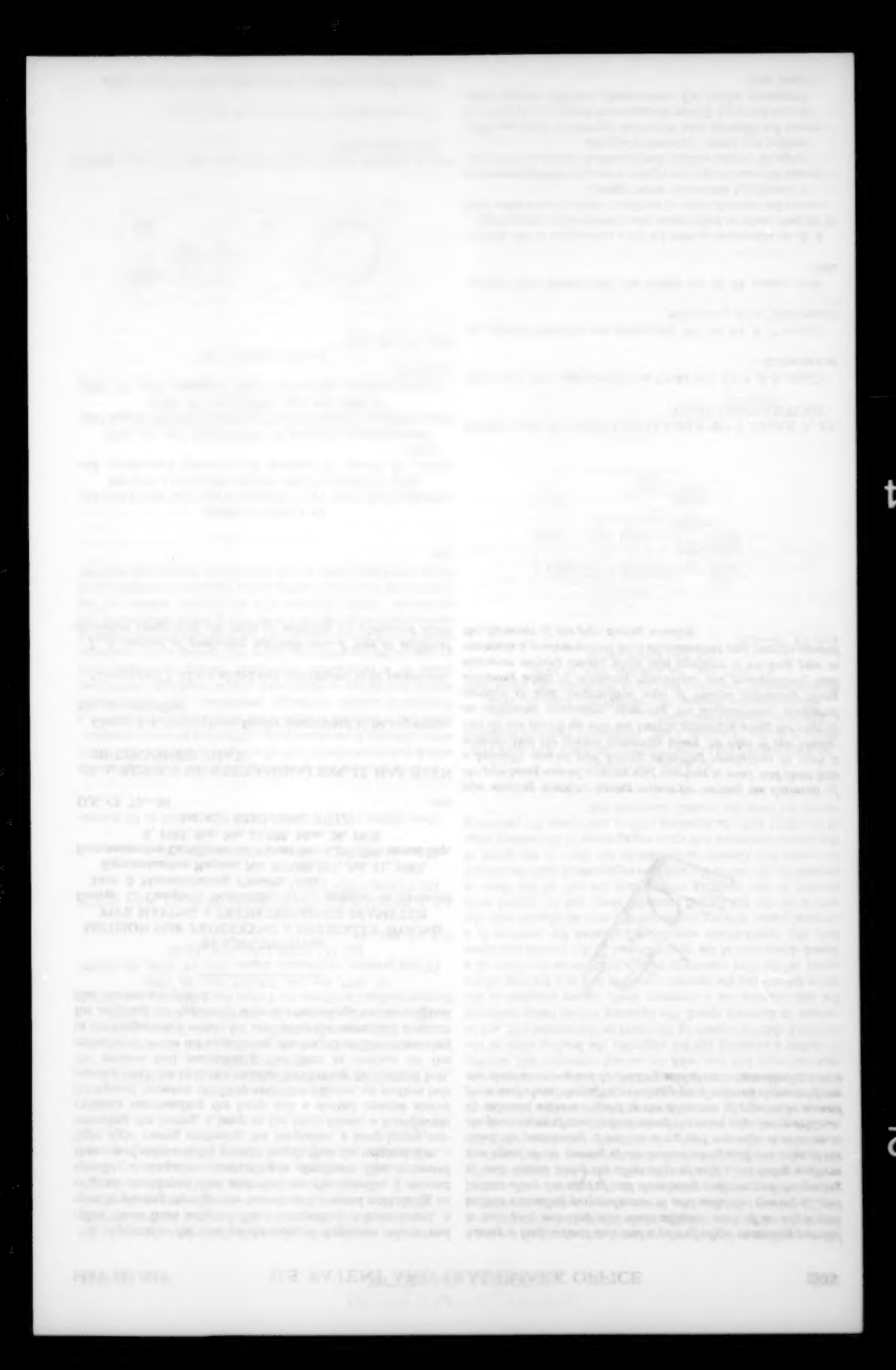
Claims 1–6, having been finally determined to be unpatentable, are cancelled.

New claims 7–12 are added and determined to be patentable.

7. *A method of producing helically wound pipe of different diameters comprising the steps of selecting an elongated sheet having a longitudinal axis and a pair of edges extending parallel to said axis, marking said sheet adjacent each of its edges with indicia extending perpendicular to said axis, the spacing of said indicia along one edge of said sheet being uniform and the spacing of said indicia along the other edge of said sheet being uniform and equal to the spacing of the indicia along said one edge of the sheet, the positioning of indicia along said one edge in relation to the positioning of said indicia along the other edge being arbitrarily selected without regard to the diameter of pipe to be wound from said sheet, thereafter winding pipe of selected diameter from the sheet thus marked by feeding said sheet longitudinally into a*



pipe winding machine having means for varying the diameter of the pipe being wound, causing said machine to wind said sheet into a helically wound pipe having adjoining revolutions in such a manner that the indicia appearing along the edge of one revolution do not match up with the indicia appearing along the edge of an adjoining revolution, observing the displacement measured parallel to said longitudinal axis of indicia appearing along adjoining edges of adjoining revolutions and manipulating said diameter varying means while said machine is winding pipe to maintain a predetermined such displacement and thereby control the diameter of the pipe during winding.



Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 31,587

PROCESS FOR THE PREPARATION OF 3-IMINOMETHYL DERIVATIVES OF RIFAMYCIN SV

Leonardo Marsili, and Carmine Pasqualucci, both of Milan, Italy, assignors to ARCHIFAR Laboratori Chimico Farmacologici S.p.A., Corso Verona, Italy

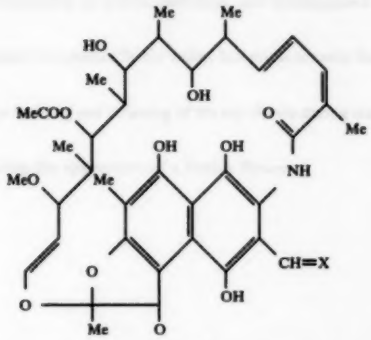
Original No. 3,963,705, dated Jun. 15, 1976, Ser. No. 472,887, May 23, 1974. Application for reissue Apr. 11, 1983, Ser. No. 483,683

Claims priority, application Italy, Jul. 25, 1973, 27066/73; Jan. 24, 1974, 19774/74

Int. Cl.³ C07D *491/08*

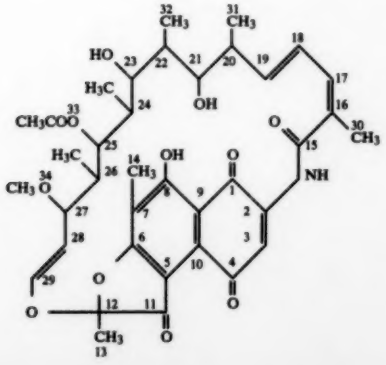
U.S. Cl. 260—239.3 P **10 Claims**

1. A process for the preparation of 3-iminomethyl derivatives of rifamycin SV of formula



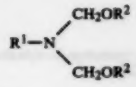
(III)

where X is the imino residue of the compound H_2X which is a primary amine, hydrazine, mono-substituted hydrazine or asymmetric di-substituted hydrazine which comprises reacting rifamycin S of formula



(II)

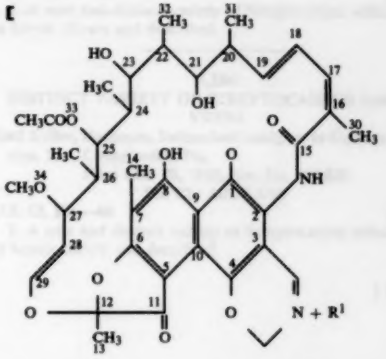
with a compound of formula



(V)

in which R^1 is lower alkyl, lower alkenyl, cycloalkyl having from 5 to 6 carbon atoms, phenyl, benzyl or α- or β-phenethyl and R^2 is hydrogen or lower alkyl, in a first inert organic solvent at a temperature ranging from 0° C. to the boiling temperature of the solvent to give a solution [of 1,3-oxazino(5,6-c)rifamycins of formula]

[



(IV)

]

in the first inert organic solvent of the intermediate compound (IV) which is the reaction product of (II) and (V), characterized by the presence of the rifamycin nucleus substituted at the 3-position by carbon which bears nitrogen to which R^1 *is attached* in which R^1 is as above defined, treating said solution *of the intermediate compound (IV)* with water and a second inert organic solvent immixible with water at a pH adjusted at a value from 4 to 6, then discharging the aqueous phase and treating the organic phase with a primary amine, hydrazine, mono-substituted hydrazine or asymmetric di-substituted hydrazine at a temperature from about 20° C. to about 80° C. under basic conditions, the derivatives (III) being finally isolated from the organic phase according usual techniques.

Re. 31,588

IMIDAZOLYLMETHYLTHIOETHYL ALKYNYL GUANIDINES

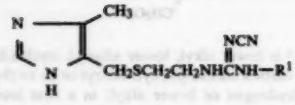
Ronnie R. Crenshaw, Dewitt, and George M. Luke, Lafayette, both of N.Y., assignors to Bristol-Myers Company, New York, N.Y.

Original No. 4,112,234, dated Sep. 5, 1978, Ser. No. 848,959, Nov. 7, 1977. Continuation-in-part of Ser. No. 826,796, Aug. 22, 1977, abandoned, which is a continuation-in-part of Ser. No. 803,009, Jun. 3, 1977, abandoned. Application for reissue Jun. 16, 1981, Ser. No. 274,291

Int. Cl.³ C07D *233/64*

U.S. Cl. 548—342 **10 Claims**

1. A compound of the formula



wherein R^1 is a straight or branched chain alkynyl group containing from 3 to 9 carbon atoms, inclusive, or a nontoxic pharmaceutically acceptable acid addition salt thereof.

Re. 31,589

THERMAL INSULATION MOLTEN METAL

Richard C. Phoenix, Lakewood, and Edward J. Jago, Berea, both of Ohio, assignors to Foseco Trading A.G., Chur, Switzerland

Original No. 3,876,420, dated Apr. 8, 1975, Ser. No. 226,933, Feb. 16, 1972. Continuation of Ser. No. 851,745, Aug. 20, 1969, abandoned. Application for reissue Apr. 8, 1977, Ser. No. 786,037

Int. Cl.³ C21B *15/02*; B22D *7/00*

U.S. Cl. 75—27 **30 Claims**

30. In a shaped heat insulating article for forming a molten-metal contacting lining for metallurgical moulds or the like which comprises a refractory composite consisting essentially of an inorganic fibrous refractory material and a granular refractory filler material, an exothermic mixture of a fuel and an oxidising agent, and a binder, the improvement wherein said fibrous refractory material is a material selected from aluminosilicate fibres and said shaped article has a density of up to 0.5 grams per cubic centimeter.

PLANT PATENTS

GRANTED MAY 22, 1984

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

5,234

CHRYSANTHEMUM PLANT

Walter H. Jessel, Jr., Fremont, Calif., assignor to California-Florida Plant Corporation, Fremont, Calif.

Filed Apr. 9, 1982, Ser. No. 366,835

Int. Cl.³ A01H *5/00*

U.S. Cl. Plt.—74 **1 Claim**

1. A new and distinctive cultivar of chrysanthemum plant, substantially as herein described, and distinguished from its parent by a darker flower color, less prone to color fading, and less twisting and reflexing of the ray florets during maturation, giving the appearance of a fresher flower.

5,235

DISTINCT VARIETY OF STREPTOCARPUS NAMED SUSI

Emil Keller, Hedingen, Switzerland, assignor to Oglevee Associates, Inc., Connellsville, Pa.

Filed Dec. 28, 1982, Ser. No. 452,818

Int. Cl.³ A01H *5/00*

U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct variety of Streptocarpus substantially as herein shown and described.

5,236

DISTINCT VARIETY OF STREPTOCARPUS NAMED VRENI

Emil Keller, Hedingen, Switzerland, assignor to Oglevee Associates, Inc., Connellsville, Pa.

Filed Dec. 28, 1982, Ser. No. 452,820

Int. Cl.³ A01H *5/00*

U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct variety of Streptocarpus substantially as herein shown and described.

PATENTS

GRANTED MAY 22, 1984

ERRATA

For CLASS	See PATENT NO.
604–051	4,449,534
272–109	4,449,716
410–080	4,449,875
410–151	4,449,876
523–116	4,449,938
585–640	4,449,961
502–107	4,450,098
502–232	4,450,099
424–238	4,450,107
260–112	4,450,154
524–265	4,450,266
502–150	4,450,302
355–075	4,450,536

PATENTS

GRANTED MAY 22, 1984

(Cont'd.)

PATENTS

GRANTED MAY 22, 1984

GENERAL AND MECHANICAL

4,449,251
NECK AND COLLARBONE PROTECTOR
Jean-Marc Gauthier, 84 Linwell Rd., St. Catharines, Ontario, Canada L2N 6B1
Continuation-in-part of Ser. No. 239,285, Mar. 2, 1981, abandoned. This application Feb. 11, 1982, Ser. No. 347,813
Int. Cl.³ A41D *13/00*
U.S. Cl. 2—2 **13 Claims**

1. A lightweight neck and clavicles protector for sports comprising:

a bib including a clavicle covering part comprising a layer of protective padding and at least one clavicle armour member mounted on the protective padding layer whereby with the protector in position on the wearer the clavicle armour member is positioned above the clavicles; and

a collar comprising a layer of protective padding and at least one throat armour member mounted on the protective padding whereby with the protector in position on the wearer the throat armour member is positioned over the throat;

the bib being attached to the collar along its entire length and the collar being provided with means for fastening it about the neck of the wearer, so that the collar holds the bib in place over the chest of the wearer and an object cannot pass between the collar and the bib.

4,449,252
PROTECTIVE GARMENT FOR A BOWLER
JoAnn J. Sullinger, 514 N. 76th St., Omaha, Nebr. 68114
Filed Jul. 1, 1982, Ser. No. 394,276
Int. Cl.³ A41D *27/12*
U.S. Cl. 2—46 **4 Claims**

1. A protective garment for a bowler, comprising,

a generally rectangular member having upper and lower ends adapted to be positioned over one of the bowler's breasts and generally extending from the bowler's shoulder to the bowler's waist,

a first elongated strap member secured at one end to said rectangular member above the lower end and adapted to be extended around the bowler's waist and detachably secured at its other end to said rectangular member,

a second elongated strap member secured at one end to the upper end of said rectangular member and adapted to extend therefrom over the bowler's shoulder and thence downwardly behind the bowler's back for connection, at its other end, to said first strap member intermediate the ends thereof.

4,449,253
QUICK EVACUATION FIREMAN'S COAT
Lon J. Hettinger, 605 N. H St., Imperial, Calif. 92251
Filed Sep. 16, 1981, Ser. No. 302,871
Int. Cl.³ A41D *1/00*
U.S. Cl. 2—93 **10 Claims**

1. An emergency evacuation coat comprising:

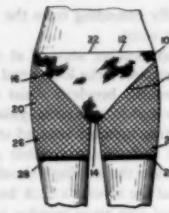
(a) a fabric coat body having a trunk defining shoulders and a neck and sides;

(b) at least one strap secured at both ends at spaced positions on said body such that said strap tends to lie flat against said coat body, and releasable means for holding said strap against said coat body intermediate said ends such that said strap will normally be held flat against said fabric in use to prevent snagging and said releasable means can be released to permit the handle to be gripped in order to aid in dragging a wearer of said coat to safety under emergency conditions.

4,449,254
GARMENT
Walter K. Fogg, 45 Kensington St., Feeding Hills, Mass. 01030
Filed Dec. 2, 1981, Ser. No. 326,575
Int. Cl.³ A41B *9/04*
U.S. Cl. 2—407 **5 Claims**

1. A bikini-type garment having a hip portion and front, rear, and crotch portions there being high cut leg openings from the crotch to points adjacent the hip portion, and an undergarment therefor including a hip portion and legs, the legs extending

out through and beyond the leg openings and covering the high cut leg openings, said legs being snug and form fitting and



tending to cover skin imperfections exposed by the leg openings, and means securing the undergarment to the garment.

4,449,255

EYEPIECE FOR PROTECTIVE DEVICES

Frederick H. Dodd, Porton near Salisbury, England, assignor to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed Mar. 6, 1981, Ser. No. 241,220

Claims priority, application United Kingdom, Mar. 11, 1980, 8008228

Int. Cl.³ A61F *9/04*

U.S. Cl. 2—428 **3 Claims**

1. A unitary transparent eyepiece adapted to be fitted into a complementary left-eye or right-eye socket in a face piece, comprising a planar outer rim having an inner edge and a circular circumferential outer edge; and a planar inner viewing zone having a circular circumferential outer edge connected to the inner edge of the planar outer rim, the angle between the planes being such that, when the planar outer rim is fitted into either complementary socket of the face piece, the inner viewing zone of the eyepiece is orthogonal to the line of forward vision of a wearer of the face piece.

4,449,256

LEG EXTENSION JUMPERS

Melvin L. Prueitt, 161 Cascabel, Los Alamos, N. Mex. 87544

Filed Feb. 23, 1981, Ser. No. 237,282

Int. Cl.³ A61F *3/00*

U.S. Cl. 3—4 **3 Claims**

1. A leg extension jumper device controlled by toe and heel action comprising in combination:

(a) vertical front and rear guide tube means,

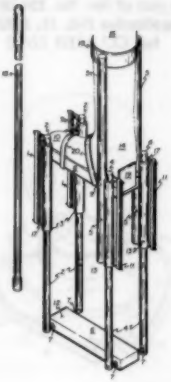
(b) an extension tube extending through each guide tube means,

(c) elastic means connecting the top portion of each extension tube and the bottom portion of its respective guide tube means,

(d) support tube means fixed to and extending above the level of the rear guide tube means,

(e) a leg strap fixed to the top of said support tube means,

(f) foot platform means pivotally connected at its front near the top of said front guide tube means and near its rear to the support tube means with the rear pivot being located directly under the ankle of a user,



(g) foot means associated with the bottoms of the front and rear extension tubes; and brace means pivotally connecting either the lower portions of the front and rear extension tube means, or the lower portion of the front guide tube means and the support tube means which, together with the foot platform means, creates a substantially pivoted parallelogram which is biased towards a rectangle by the elastic means.

4,449,257

INTRAOCULAR LENS AND METHOD OF RETAINING IN PLACE

Erich A. Koeniger, Metairie, La., assignor to Barnes-Hind/Hydrocurve, Inc., Sunnyvale, Calif.

Filed May 3, 1982, Ser. No. 373,935

Int. Cl.³ A61F *1/16, 1/24*

U.S. Cl. 3—13 **5 Claims**

1. An intraocular lens for placing in a posterior chamber capsule and comprising:

(a) plastic HEMA circular body means for emplacement when dry and contracted, and to expand in place when softened by acqueous humor uptake of the environment; and

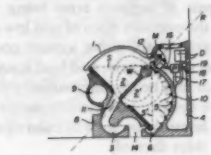
(b) concentric groove means defined around peripheral margins on both sides of said body means for frictionally engaging the interior walls of said posterior capsule.

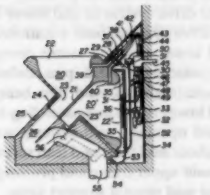
4,449,258

WATER-CLOSET WITH ROTARY DOUBLE PAN

Remo Ackermann, and Walter Ackermann, both of 6986 Novaggio, Switzerland

PCT No. PCT/CH81/00021, 371 Date Oct. 22, 1981, 102(e) Date Oct. 22, 1981, PCT Pub. No. WO81/02436, PCT Pub. Date Sep. 3, 1981
PCT Filed Feb. 24, 1981, Ser. No. 314,836
Int. Cl.³ E03D 1/00, 3/00, 5/00
U.S. Cl. 4—300 5 Claims





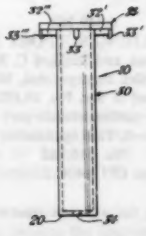
1. Water-closet having a lavatory pan arrangement, whereby the lavatory pan arrangement consists of two essentially identical pans (2, 2'; 20) which are movable into each others position by rotating them around a common axis (R) each said pan defining a different water inlet and a water and waste exit in each position, both of the pans (2, 2'; 20, 20') being provided with edges (S, 22) which are designed as seats, and each of the edges taking alternatively a horizontal position in which the corresponding pan (2, 20) is ready for utilisation while the other one (2', 20') is exposed to a rinsing installation (5; 35, 36).

4,449,259

FLUSH TANK METERING DEVICE

Evan Davies, 1130 SW. 6 St., Fort Lauderdale, Fla. 33312, and John C. Marmon, Jr., 2597 Hinda Rd., Lake Park, Fla. 33403

Filed Sep. 3, 1982, Ser. No. 414,892
Int. Cl.³ E03D 1/00
U.S. Cl. 4—415 1 Claim



1. An insertable flush tank water metering device for a conventional flush tank type toilet with a generally vertical vent tube in fluid communication with a toilet bowl trap, and a filler water tube for dispensing filler water connected to said vent tube, comprising:

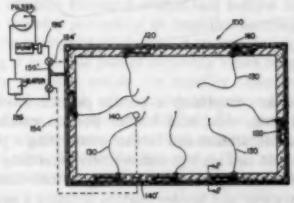
a stationary conduit metering means having an upper means for causing excess filler water to aid in filling the flush tank, and lower means for measuring water to the toilet bowl trap, said metering means constructed and arranged for inserting into the vent tube for receiving and metering of a selected quantity of filler water from the filler water tube to fill the toilet bowl trap and for causing any excess quantity of filler water received into the vent tube to overflow out of the vent tube into the flush tank as a result of metering a lesser amount of filler water out said lower means of said metering means during refilling of the toilet bowl trap and holding means for holding stationary said conduit metering means within said vent tube, said metering means is a conduit with an upper inlet; said upper means is a flange connected around said inlet; said lower means is an aperture smaller than said inlet; and said holding means includes said inlet and said flange provides direct access of flush tank water to overflow into the vent tube.

4,449,260

SWIMMING POOL CLEANING METHOD AND APPARATUS

Brackston T. Whitaker, 6020 E. Speedway, Tucson, Ariz. 85712

Filed Sep. 1, 1982, Ser. No. 413,708
Int. Cl.³ E04H 3/18, 3/20
U.S. Cl. 4—490 11 Claims



1. In the hydraulic cleaning of fluid reservoirs, said reservoirs having a fluid circulating system, comprising in sequence reservoir, reservoir drain line, pump, filter and return line, interconnected to each other:

(A) plural, extensible and retractable, open-end flexible conduits removably housed in walls of the reservoir, said conduits each having a pressure-responsive head fixed to ends thereof, responsive to the flow of fluids therethrough, to extend and retract said conduit means into and out of the fluid reservoir, for submersible fluid injecting interruption contact with each other:

(B) a valve assembly having in-line valves interposed within the fluid circulating system, comprising multichambered control to regulate modes of: first, normal filtering run of the reservoir with retracted conduits; secondly, cleaning and filtering same with extended conduits and thirdly, retracting the conduit means, precedent to return to normal run;

(B 1) a first of said valve assembly having as single control stem, said first valve interconnecting reservoir, pump return and conduits, said valve connecting the reservoir return and pump in the normal run and connecting to open end conduits in the cleaning mode;

(B 2) a second of said valve having a single control stem, interconnecting the conduits, drain and pump, whereby upon coordinate actuation of the respective valves the three modes of operation may be effected; whereby the

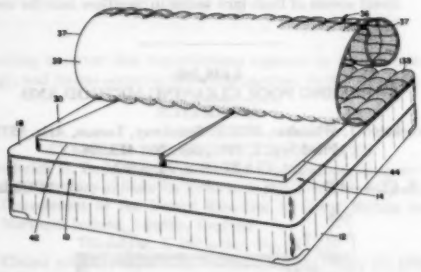
volume and pressure applied to the conduits may be selectively controlled to effect the speed of extension for retraction and the distance of extension thereof.

4,449,261

BED MATTRESS HAVING AN IMPROVED PILLOW TOP

Robert A. Magnusson, Atlanta, Ga., assignor to Simmons U.S.A. Corp., Atlanta, Ga.

Filed Jun. 22, 1981, Ser. No. 275,955
Int. Cl.³ A47C 23/04, 27/05, 27/14
U.S. Cl. 5—465 18 Claims



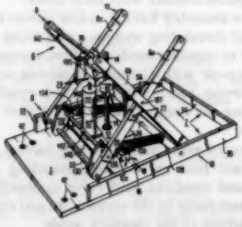
1. A mattress comprising a border portion having a top, bottom and outer side, said border portion extending in a continuous configuration and further comprising a plurality of coil springs, said coil springs transversely extending the entire height of said border portion and having an individually pocketed configuration; said border portion defining a periphery of a cavity disposed therein; at least one mattress core receptably received with said cavity and comprising a plurality of spring coils placed therein, each of said coils being individually enveloped with a pocketing material to form a plurality of pocketed coils; said mattress further comprising a removable pillow top having differing physical characteristics on the opposite surfaces thereof, said pillow top having slideable fastener means for removably and reversibly fastening said pillow top along the periphery thereof to the top of said border portion along the outer periphery of said border portion of the mattress.

4,449,262

MEDICAL COUCH INCORPORATING A LIFTING MECHANISM

Hendrick Jahsman, Berkeley, and George Menor, Martinez, both of Calif., assignors to Siemens Medical Laboratories, Inc., Walnut Creek, Calif.

Filed Sep. 8, 1981, Ser. No. 299,881
Int. Cl.³ A61G 7/00
U.S. Cl. 5—63 6 Claims



1. A medical couch, comprising in combination:
(a) a lower frame arranged in a first horizontal plane;
(b) an upper frame for carrying a patient table top, said upper frame being arranged in a second horizontal plane above said first horizontal plane;
(c) a scissors action link mechanism interconnecting said lower frame with said upper frame for moving said upper frame parallel to said lower frame between lowered and raised positions, and vice versa, said link mechanism including a single first and a single second pair of pivotally interconnected support arms, said first pair of support arms being vertically arranged between one side of said lower frame and one side of said upper frame, and said second pair of support arms being vertically arranged between the opposite sides of said lower and upper frames;
(d) an electric motor drive system containing an electric motor and a lead screw, said lead screw being rotatable by said motor and being longitudinally fixed with respect to said drive system, said electric motor drive system comprising a housing having a circular opening in each of two opposite sides thereof;
(e) lower pivoting means for pivotally connecting said electric motor drive system to said lower frame and for pivoting said drive system about a stationary lower horizontal axis, said lower pivoting means comprising two pins arranged horizontally, said pins defining said stationary lower horizontal axis, said pins being firmly connected with said lower frame and extending into a corresponding one of said openings, said lower pivoting means thereby rotating about said pins, said lead screw thereby extending towards said upper frame and pivoting in a plane which is parallel to said pivotal support arms;
(f) a nut element arranged between said first and said second pairs of support arms, said nut element being mounted on said lead screw for travelling therealong;
(g) upper pivoting and supporting means connected to said nut element for pivoting said nut element about an upper horizontal axis and for supporting said link mechanism, said upper horizontal axis being movable parallel to and being arranged elevated above said lower horizontal axis, such that said upper pivoting and supporting means selectively adjusts the elevation of said link mechanism above said lower frame when said motor is in operation and when said nut element travels along said lead screw, thereby moving said upper frame to a selected position; and
(h) security means for preventing a sudden return of said upper frame from said raised position to said lowered position.

4,449,263

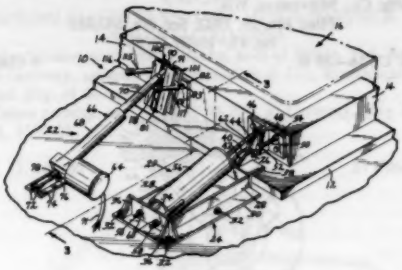
POWERED FOLDING SUPPORT STRUCTURE

Kermit H. Wilson, Edina, and Richard C. Bue, Chaska, both of Minn., assignors to Sico Incorporated, Minneapolis, Minn.

Continuation-in-part of Ser. No. 99,655, Dec. 3, 1979, abandoned, which is a continuation-in-part of Ser. No. 69,588, Aug. 24, 1979, abandoned. This application Dec. 16, 1980, Ser. No. 216,982
Int. Cl.³ A47C 17/40
U.S. Cl. 5—133 4 Claims

1. A drive coupling for a power operated folding support structure comprising:
a first force transmitting member comprising a friction plate, and means attaching said friction plate to the folding structure and projecting outwardly therefrom; and
second force transmitting members comprising a pair of friction members, and means including a pair of clamping members, one positioned alongside each of the friction members, and including bolts for urging the clamping members together to apply friction force to the friction plate, to provide a normally operative drive coupling

between the folding support structure and the power operating apparatus, and to permit slippage between the



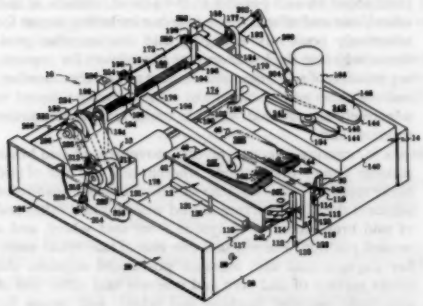
force transmitting members in the event of the application of excessive force to the folding support structure.

4,449,264

SYSTEM FOR FORMING CUSTOM-MADE SHOE INSERTS

Vérn R. Schwartz, Boulder Creek, Calif., assignor to AMFIT, Inc., Sunnyvale, Calif.

Filed Jul. 23, 1981, Ser. No. 286,245
Int. Cl.³ A43D *9/00*
U.S. Cl. 12—1 R **1 Claim**



1. A system for forming a custom-made shoe insert for a person's foot, said system comprising:

impression means for forming and releasably retaining an impression of the contour of the undersurface of the person's foot;

holding means for holding a blank;

shaping means for sensing the impression and cutting away material from the blank in conformance with the sensed impression;

drive means for automatically driving the shaping means both laterally and to-and-fro across the impression and the blank to automatically form the custom-made shoe insert from the blank in conformance with the impression; and

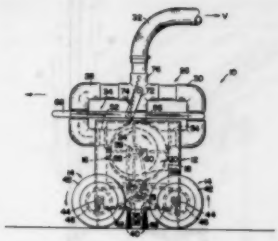
sensing and switching means for automatically stopping the drive means when the shaping means is in both a desired lateral position and a desired to-and-fro position.

4,449,265

SWIMMING POOL SWEEP

James S. Hoy, 7340 Filbert La., Tampa, Fla. 33617

Filed Mar. 1, 1983, Ser. No. 471,048
Int. Cl.³ E04H *3/20*
U.S. Cl. 15—1.7 **6 Claims**



1. A vacuum powered automatic swimming pool sweep for cleaning the bottom of a swimming pool comprising a hollow housing supported by at least one pair of reversible wheels, a reversible impeller disposed within said hollow housing, said reversible impeller including an impeller housing having an impeller chamber formed therein, a reversible impeller member having at least one pair of opposing vanes coupled thereto operatively disposed within the impeller chamber and interconnected to said pair of reversible wheels, a fluid flow conduit including a first and second fluid flow path coupled between an external vacuum line and said impeller chamber, a directional control movable between a first and second position in communication with said fluid flow conduit to selectively direct water from the pool through said impeller chamber to impinge on said vanes coupled to said reversible impeller member to drive the pair of reversible wheels, said directional control causing water to flow through said first fluid flow path when in said first position to drive said swimming pool sweep in one direction and causing water to flow through said second fluid flow path when in said second position to drive said swimming pool sweep in the opposite direction.

4,449,266

TOOTHBRUSH WITH TWO SEGMENTS OF BRISTLES

Karl-Heinz Nörthemann, Ringstrasse 18, D-3501 Schauenburg, 4, and Heinrich Krahn, Schönfelderstrasse 4, D-3507 Baunatal 5, both of Fed. Rep. of Germany

Continuation-in-part of Ser. No. 946,835, Sep. 27, 1978, abandoned, which is a division of Ser. No. 684,184, Jul. 1, 1976, Pat. No. 4,131,967. This application Mar. 9, 1982, Ser. No. 356,409
Int. Cl.³ A46B *9/04*
U.S. Cl. 15—167 A **16 Claims**

1. A toothbrush made of a thermoplastically deforming plastic comprising

an elongate handle having a grip portion, a front end segment with a tapered portion directed away from the grip portion, a back end, an upper side, and a longitudinal axis, the handle having defined therethrough a first, center plane containing said longitudinal axis,

a pair of bristle-bearing segments;

a plurality of bristle bundles mounted in said pair of bristle-bearing segments, each bundle having free ends of bristles, and

a pair of short, thermoplastically shaped connection arms joining said pair of bristle-bearing segments to said front end segment at said tapered portion, said connection arms, bristle-bearing segments and handle forming a fork having two prongs, each prong containing one bristle-bearing segment and one connection arm, said prongs being located on opposite sides of said first center plane and substantially below a second center plane perpendicular to

said first center plane and containing said longitudinal axis, said bristle-bearing segments having mutually facing inside surfaces sloping toward each other in a gable-manner, planar extensions of said inside surfaces intersecting above said upper side of said handle at a first angle of less than 55°, said plurality of bristle bundles being mounted

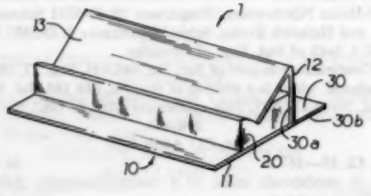
on said inside surfaces, said free ends of said bristle bundles bounding a gap and defining side surfaces for contact in use with teeth, said side surfaces sloping in a gable-manner toward each other, planar extensions of said side surfaces intersecting above said gap at a second angle which is less than said first angle.

4,449,267

FLOOR SEAL STRIP

Edward D. Siemion, 1027 Arlington Ave., Grand Haven, Mich. 49417

Filed May 26, 1982, Ser. No. 382,143
Int. Cl.³ A47L *13/50*
U.S. Cl. 15—257 R **13 Claims**



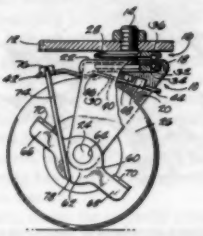
1. A floor sealing strip, comprising:
a fluid impermeable base element;
a fluid impermeable barrier element connected to and extending upward from said base element;
means for affixing the sealing strip to a floor, said affixing means barring fluid communication between said base element and the floor beneath said base element when said base element is in a position of use, said affixing means extending from said barrier element in the same plane as said base element in a direction opposite said base element;
a cushion element in abutment with said barrier element and which extends laterally from said barrier element and extends above said base element;
whereby said sealing strip when in a position of use prevents the flow of fluid past said sealing strip, and when said sealing strip is placed in a position of use abutting a door, said cushion element abuts said door.

4,449,268

CASTER WHEEL BRAKE HAVING AN OVERCENTER LATCH

Henry A. Schauell, Milwaukee, Wis., assignor to E. R. Wagner Mfg. Co., Milwaukee, Wis.

Filed Jan. 29, 1982, Ser. No. 343,889
Int. Cl.³ B60B *33/00*
U.S. Cl. 16—35 R **5 Claims**



1. A caster comprising
a support member adapted to be connected to a load to be supported by the center,
a yoke including a pair of parallel spaced arms joined by a horizontal web, said arms including lower ends rotatably supporting a wheel for rotation about a horizontal axis, and said web including a lower surface,
means for rotatably joining said yoke to said support member for rotation about a vertical axis, said means for rotatably joining including a disc member fixed to said support member and positioned adjacent the lower surface of said web, and
means for braking said wheel against said rotation and said yoke against rotation about said vertical axis, said means for braking including
a brake member having opposite ends, said brake member being pivotally supported by said yoke for pivotal movement about an axis parallel to the axis of rotation of said wheel, one end of said brake member including means for selectively positively engaging said disc member positioned adjacent the lower surface of said web for preventing rotation of said yoke with respect to said disc member, and the other end of said brake member being adapted to selectively engage said wheel to brake said wheel against rotation, and
means for causing selective pivotal movement of said brake member from a first position wherein said one end of said brake member is spaced from said disc member positioned adjacent the lower surface of said web and said other end of said brake member is spaced from said wheel, and a second position wherein said one end of said brake member engages said disc member positioned adjacent the lower surface of said web and wherein said other end of said brake member engages said wheel, said means for causing selective pivotal movement of said brake member including
a brake lever having opposite ends and being supported for pivotal movement about said axis of rotation of said wheel between a first position wherein said brake member is in said first position and a second position wherein said brake member is in said second position, and
means for joining said other end of said brake member to said brake lever and for moving said brake member to said brake member first position when said brake lever is moved to said brake lever first position and for moving said brake member to said brake member second position when said brake lever is moved to said brake lever second position, said means for joining including an elongated member having an upper end joined to said other end of said brake member and a lower end pivotally joined to said brake lever intermediate its opposite ends and below said axis of rotation, said lower end of said elongated member moving past said axis of rotation of said wheel

when said brake lever moves from said brake lever first position to said brake lever second position.

4,449,269

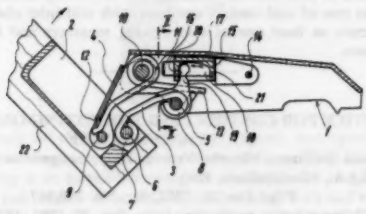
SPRING BIASED FURNITURE HINGE HAVING A BRAKE MECHANISM

Günter Sundermeier; Ulrich Benke, both of Bünde, Fed. Rep. of Germany, assignor to Paul Hettich & Co., Kirchlengern, Fed. Rep. of Germany

Claims priority, application Fed. Rep. of Germany, May 21, 1981, 3120201

Int. Cl.³ E05F *3/20*

U.S. Cl. 16—50 **11 Claims**



1. A furniture hinge for two housing parts movable relative to one another, comprising

a housing mounted on one furniture part;

a hinge arm mounted on the other furniture part;

two pivotable hinge plates pivotally connecting said housing with said hinge arm;

locking means provided with a spring mounted on one of the hinge plates;

a cylinder-and-piston unit having a piston pivotally mounted on said hinge arm and having a first sliding surface, and a brake cylinder slidably movable relative to said piston and having a second sliding surface;

a cam lever mounted on another of said hinge plates and arranged to move said brake cylinder relative to said piston; and

means for increasing friction between said brake cylinder and said piston and including a friction-increasing coating provided on at least one of said first and second sliding surfaces.

4,449,270

HANGING DEVICE FOR CURTAIN STRAPS OUT OF RESILIENT PLASTIC MATERIAL FOR CLOSING BUILDING OPENINGS

Henri Brabant, La Cote, 43220 Dunieres, France

PCT No. PCT/FR81/00014, 371 Date Oct. 7, 1981, 102(e) Date Oct. 7, 1981

PCT Filed Feb. 6, 1981, Ser. No. 309,892

Claims priority, application France, Feb. 8, 1980, 80 02832

Int. Cl.³ A47H *1/04*

U.S. Cl. 16—87.4 R **2 Claims**

1. A hanging device for hanging straps out of resilient plastic material adapted to be a screen or a curtain for closing apertures, partitioning or insulating premises, which comprises:

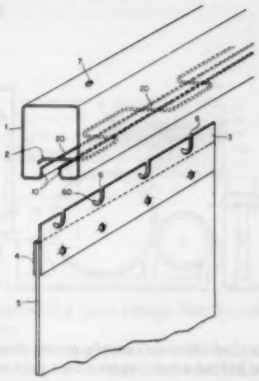
an elongated hollow girder in the form of an inverted U opening downwardly, and

rigid strap hanging members having lower parts, each of said parts being secured to the upper end of a strap,

each hanging member (3) comprising at its upper part, several equidistantly spaced openings (6) each beginning at the upper edge of the hanging member and being prolongated interiorly towards at least a same lateral direction so as to constitute spaced hooks arranged for engagingly cooperating with parallel and equidistant transveral complementary members sustained by the girder (20;8),

said complementary members having a thickness lesser than the width of said openings (6) and extending transversally inside said girder (1,1') above the plane of the lower edges of said girder,

said transversal complementary members being made of a single piece with a hooking structure introduced within the girder (1) comprises a rod (2) formed with a series of



U-shaped alternate folds extending in a same plane, wherein the grider (1) has wings (10), the end portions of which are folded inwardly in the direction one towards each other and further extend slightly upwardly inside the grider while being separated one from each other, the transversal complementary members (2) bearing upon the inner edges of said folded and inwardly extending wings.

4,449,271

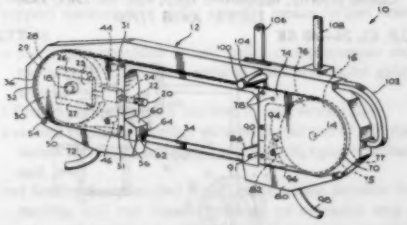
CARCASS SAW

Ralph Karubian, 7100 S. Avalon Blvd., Los Angeles, Calif. 90003

Filed Oct. 15, 1982, Ser. No. 432,344

Int. Cl.³ A22B *5/20*; B27B *13/02*

U.S. Cl. 17—23 **10 Claims**



1. An improved carcass saw; including:

a frame;

first and second rims spaced from each other and each rotatably supported from said frame;

a common saw blade carried by both said rims;

a pair of guide blocks supported from said frame adjacent respective ones of said rims for orienting said blade;

first cover means supported from said frame and covering said first rim;

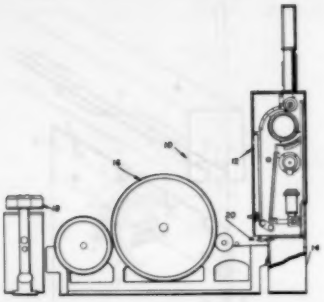
second cover means supported from said frame and covering said second rim; and,

first and second troughs rotatably supported from said frame beneath said first and second rims, respectively.

4,449,272
CHUTE FEED ADJUSTMENT FOR CARD EVENNESS

Leonard D. Cash, Gastonia, N.C., assignor to Fiber Controls Corporaton, Gastonia, N.C.

Filed Apr. 22, 1982, Ser. No. 370,843
Int. Cl.³ D01G 15/42
U.S. Cl. 19—105 9 Claims



1. For a card inlet web supply means that is adapted to be juxtaposed behind a card, upon a card inlet web supply means support,

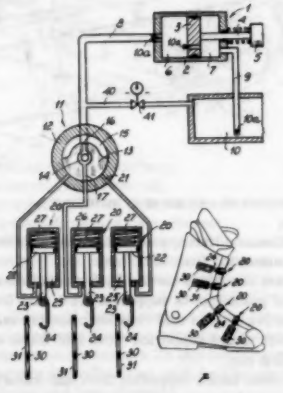
apparatus for adjusting side-to-side uniformity in density of the card outlet web, comprising:

means for adjustably pivoting the card inlet web supply means about a generally vertical axis in such a sense as to bring one lateral end of the card inlet web supply means relatively closer to and further from the card without consequently correspondingly bringing the opposite lateral end of the card inlet web supply means closer to and further from the card, thereby regulating the horizontal angle of web feed to the card in order to regulate side-to-side uniformity in card outlet web density.

4,449,273
HYDRAULIC DEVICE PARTICULARLY FOR SKI BOOT FASTENING

Giorgio Baggio, S. Martino di Lupari, Italy, assignor to Nordica S.p.A., Montebelluna, Italy

Filed Jan. 20, 1982, Ser. No. 340,948
Claims priority, application Italy, Jan. 28, 1981, 19384 A/81
Int. Cl.³ A43B 11/00
U.S. Cl. 24—68 SK 3 Claims

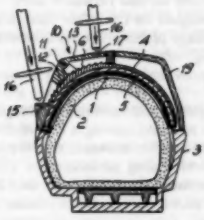


1. A device for fastening ski boots, comprising a fluid reservoir, a pumping means connected to said reservoir for pumping fluid out of said reservoir, a selector assembly having an inlet chamber connected to said pumping means for receiving fluid pumped by said pumping means and further connected to said reservoir for returning fluid into said reservoir, valve means associated to said pumping means for allowing feeding of fluid from said reservoir toward said inlet chamber and preventing fluid from passing through said pumping means toward said reservoir, valve means between said selector assembly and said reservoir for controlling return of fluid from said selector assembly to said reservoir, a plurality of fluid-operated driving members arranged on a portion of said ski boot and having means for fastening said portion with another portion of said ski boot, control conduits each connecting one of said driving members with said selector assembly, and means in said selector assembly for selectively connecting at least one of said control conduits with said inlet chamber to operate at least one of said driving members and fastening means.

4,449,274
DEVICE FOR CONTROLLING THE FITTING-ON OF SKI BOOTS AND THE LIKE

Renzo Balbinot, Vittorio Veneto, Italy, assignor to Nordica S.p.A., Montebelluna, Italy

Filed Jan. 20, 1982, Ser. No. 340,947
Claims priority, application Italy, Jan. 28, 1981, 19382 A/81
Int. Cl.³ A43B 11/00, 5/04; A43C 11/00
U.S. Cl. 24—70 SK 5 Claims



1. A device for controlling the fitting-on of ski boots and the like, comprising a pressure band extending transverse to the boot at a middle front portion thereof and having one end secured to the boot at a side portion thereof, a tension band extending above said pressure band and having one end connected to another end of said pressure band, and releasable locking means for operation on another end of said tension band to tension said pressure band, said tension band being actuatable by a skiing stick, wherein said releasable locking means comprises a substantially saw-tooth serration formed at said another end of said tension band and an oscillating lever element supported by the boot and having a pawl portion at one end for engaging said serration, said pawl portion having a serration enabling a translation of said tension band in a pulling direction and preventing a translation thereof in an opposite direction.

4,449,275
DEVICE TO SECURE BELTS AND SIMILAR PARTS TO RESIN STRUCTURES, HELMETS IN PARTICULAR

Pier L. Nava, Via Carnovali 100/C, Bergamo, Italy

Filed Sep. 8, 1982, Ser. No. 415,966
Claims priority, application Italy, Oct. 1, 1981, 24257 A/81
Int. Cl.³ A44B 17/00
U.S. Cl. 24—458 12 Claims

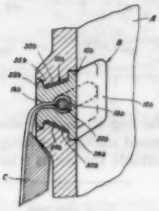
1. Device for securing belts and similar items to a wall of a structure, comprising

a block made of resilient material, said block having a first end, a second end and a body, said body of the block having a bore going there through, said body of the block

having slot means crossing said body from said bore to said second end;

a removable member inserted within said bore of the block;

belt means passing first time through said slot means bending around said removable member located within the bore and passing second time said slot means, so that two ends of said belt protrudes from said second end of the block;



said wall of the structure having at least one opening adapted to accommodate an outside surface of said block;

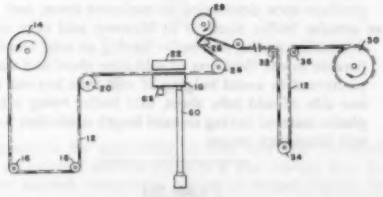
whereby in an assembled condition of said device said first end and outside surface of the block engage with said wall and said opening of the structure for tight securing of the belt inside of said bore and said slot means of the block.

4,449,276

METHOD FOR SMOOTHING AND BRUSHING PILE FABRIC

Walter Engels, Tryon, N.C., assignor to Milliken Research Corporation, Spartanburg, S.C.

. This application Jul. 21, 1982, Ser. No. 400,768
Int. Cl.³ D06C *3/06, 27/00*
U.S. Cl. 26—2 R **1 Claim**



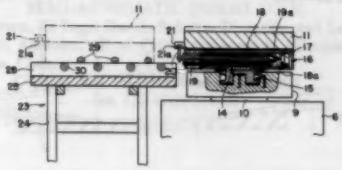
1. A method of brushing the pile of a pile fabric on an apparatus having spaced rotating brushes comprising the steps of: supplying a web of pile fabric over the apparatus with the edges of the pile fabric inoperative relationship with the brushes, simultaneously heating the pile fabric on the pile side of said fabric and applying suction pressure to the other side while the rotating brushes brush the edges of the fabric in an outward direction, sensing the edges of the pile fabric and cutting off the rotation of the brush on the side of the apparatus to which the edge of the pile fabric has moved laterally beyond a pre-determined point and allowing the other rotating brush to pull the pile fabric laterally in the opposite direction until it moved laterally inward beyond the pre-determined point, brushing the heated pile of the pile fabric, allowing the pile to cool and taking up the brushed fabric.

4,449,277

MACHINE TOOL WITH A PALLET CHANGE FUNCTION

Toshifumi Hasegawa, Kariya, and Norikazu Kanii, Chita, both of Japan, assignors to Toyoda Koki Kabushiki Kaisha, Kariya, Japan

Filed Sep. 21, 1982, Ser. No. 420,638
Claims priority, application Japan, Sep. 24, 1981, 56-149370
Int. Cl.³ B23Q *41/02*
U.S. Cl. 29—33 P **5 Claims**



1. A machine tool with a pallet change function comprising:

a machine frame;

a tool spindle rotatably supported on said machine frame;

a work table movable on said machine frame, relative to said tool spindle;

a work pallet for supporting a workpiece thereon;

a pallet clamp member having a pallet guide way for guiding said work pallet thereonto, said pallet clamp member vertically movably mounted on said work table for clamping and unclamping said work pallet onto and releasing it from the work table;

pallet support means having first and second support stations for supporting said work pallet to be loaded onto said work table and for receiving said work pallet unloaded from said work table;

positioning means for effecting relative movement between said work table and said pallet support means so as to establish a predetermined positional relation between said work table and a selected one of said first and second support stations;

pallet transfer means for transferring said work pallet between said work table in said predetermined positional relation and said selected one of said first and second support stations, said pallet transfer means further comprising

a rod means provided in said pallet clamp member and movable in a direction parallel with said pallet guide way;

a first engaging member secured to said work pallet;

a second engaging member secured to one end of said rod means and engageable with said first engaging member; and

rod feed means provided in said pallet clamp member for moving said rod means between an extended and a retracted position such that in said extended position said second engaging member is positioned under said first engaging member of said work pallet on said selected one of said first and second support stations and in said retracted position said second engaging member is positioned under said first engaging member of said work pallet on said work table; and

a clamp actuator provided in said work table for vertically moving said pallet clamp member so as to selectively clamp and unclamp said work pallet onto and releasing it from said work table and to selectively engage and disengage said second engaging member with and from said first engaging member of said work pallet on said selected one of said first and second support stations.

4,449,278

ROLLER FOR SUPPORTING MATERIAL SENSITIVE TO RADIATION AND, METHOD OF MAKING THE SAME

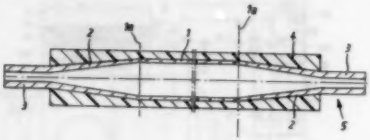
Erwin Geyken, Neubiberg; Horst Köninger, and Günter Schirk, both of Munich, all of Fed. Rep. of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Feb. 24, 1982, Ser. No. 352,004

Claims priority, application Fed. Rep. of Germany, Mar. 26, 1981, 3111923

Int. Cl.³ B21B *31/08*; B21D *31/00*

U.S. Cl. 29—132 **37 Claims**



1. A roller for supporting material sensitive to radiation, particularly for transporting and/or squeezing sheet-like photographic material, consisting essentially of:

(a) an elongated supporting member having a central portion of predetermined cross-sectional area and ends of smaller cross-sectional area constituting journals for said roller, said member being devoid of mechanical connectors and frictional connections for holding the same together; and

(b) a protective coating on said member.

18. A method of making a roller for supporting material sensitive to radiation, particularly for transporting and/or squeezing sheet-like photographic material, comprising the steps of:

(a) providing an elongated blank having opposite end portions;

(b) subjecting the end portions to deforming forces which reduce the cross-sectional areas of said end portions to thereby form an elongated supporting member having a central portion of predetermined cross-sectional area flanked by two opposite ends of smaller cross-sectional area, said blank and said member being devoid of mechanical connectors and frictional connections for holding the same together; and

(c) applying a protective coating to said member to thereby form a roller consisting essentially of said elongated supporting member and said protective coating, said member constituting a core and said opposite ends constituting journals for said roller.

4,449,279

BAG SYSTEM FOR TRANSPORTATION OF BULK LIQUIDS

Seiji Takeuchi, Burlington, Canada, assignor to Don Fell Limited and Lawrence Fell Limited, Hamilton, Canada

Division of Ser. No. 235,836, Feb. 19, 1981. This application Apr. 21, 1983, Ser. No. 487,056

Claims priority, application Canada, Jan. 7, 1981, 368021

Int. Cl.³ B23P *7/00*

U.S. Cl. 29—401.1 **2 Claims**

1. A method of using a bag of tough, flexible sheet material for the one-way transportion of liquid in bulk, said bag being filled tight except for controlled access means for filling and emptying the bag, said bag having a series of spaced-apart tie down means secured to said material,

said method comprising

(a) mounting the bag in a freight container and thereupon filling it with bulk liquid,

(b) transporting the freight container to a desired destination and there emptying the liquid from the bag, and

(c) cutting the bag to form a sheet with said tie down means disposed around the periphery thereof to render the same suitable for use as a tarpaulin.

4,449,280

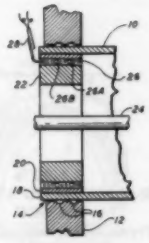
EXPLOSIVE TUBE EXPANSION

Joseph W. Schroeder, Clark, N.J., assignor to Foster Wheeler Energy Corporation, Livingston, N.J.

Filed Nov. 9, 1981, Ser. No. 319,334

Int. Cl.³ B23P *17/00*; B21D *53/00*

U.S. Cl. 29—421 E **9 Claims**



1. Apparatus for expanding a tube within a tube sheet comprising:

an insert sized to fit coaxially within said tube;

detonation means encircling said insert and operable to produce upon detonation an explosive force; and

an annular buffer sized to fit between said tube and said detonation means, said buffer having an axial length comparable to the thickness of said tube sheet and sized and positioned to avoid bulging of said tube beyond at least one side of said tube sheet, said buffer being a band of plastic material having an axial length equivalent to that of said detonation means.

4,449,281

METHOD OF PRODUCING MULTIPLE-WALL, COMPOSITE TUBULAR STRUCTURES

Toshio Yoshida, Kobe; Shigetomo Matsui, Higashiosaka, and Toshio Atsuta, Akashi, all of Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Hyogo, Japan

Filed Mar. 16, 1982, Ser. No. 358,800

Int. Cl.³ B23P *17/00*

U.S. Cl. 29—421 R **5 Claims**

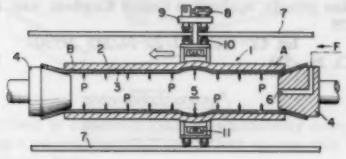
1. A method of producing multiple-wall composite tubes, said method comprising:

inserting an inner tube into an outer tube;

applying pressure to the interior of said inner tube and thereby causing said inner tube to expand plastically into tight contact with said outer tube;

with said inner and outer tubes in such state of tight contact, and while said pressure is maintained applying heat from the outside to said outer tube only without applying sub-

stantially any heat to said inner tube and thereby creating a temperature difference between said inner and outer tubes and causing said outer tube to expand in diameter, said applying heat comprising establishing, by high-frequency induction heating means, a locally heated zone of said outer tube substantially around the circumference thereof, and causing said heated zone to travel from one



end to the other end of said outer tube, thereby causing said outer tube to successively expand locally in the traveling heated zone; and

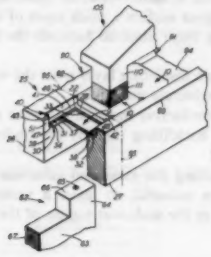
then removing said pressure from the interior of said inner tube, and permitting said tubes thereafter to obtain ambient temperature and obtain a fit of high degree of interference therebetween.

4,449,282

ASSEMBLING COMPONENTS SUCH AS LIDS TO CHIP ENCLOSURES

Bruce C. Abraham, Limekiln; Charles R. Fegley, Laureldale, and Jerry C. Hurst, Reading, all of Pa., assignors to AT&T Technologies, Inc., New York, N.Y.

Filed Aug. 18, 1982, Ser. No. 409,381
Int. Cl.³ B23Q *7/00*
U.S. Cl. 29—467 **10 Claims**



1. Apparatus for assembling at least one first component having an external surface opposite a first mating face to at least one second component having a second mating face complementary with and joinable to the first mating face of the first component, comprising:

at least one assembly station containing a first positioning frame having first walls for confining and first ledges projecting therefrom for supporting a first component, said frame having a peripheral opening suitable for passing therethrough portions of component transfer means associated with said assembling;

means for holding at least one first component with its external surface exposed for contact to pick up and transfer the same to the assembly station;

means for transferring at least one first component including at least one finger having means proximate a free end for contacting the external surface to pick up a first component and for releasably retaining the same, said transfer means being movable between the holding means and the first positioning frame along a path such that the finger passes through the peripheral opening in said frame in an inverted orientation and deposits the first component with its mating face turned upward upon the first ledges, confined by the first walls of said frame; and

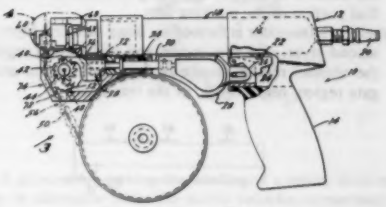
means, in communication with the assembly station, for guidably delivering thereto at least one second component with its mating face downward and in registration with the first mating face of a first component to thereby assemble the first and second components.

4,449,283

SEMI-AUTOMATIC INSERT TOOL

Imre Berecz, El Toro; Dennis Schultz, Riverside, and Leroy O. Daniel, Anaheim, all of Calif., assignors to Microdot Inc., Darien, Conn.

Filed Jun. 16, 1982, Ser. No. 369,022
Int. Cl.³ B23P *19/02*
U.S. Cl. 29—566.1 **1 Claim**



1. A semi-automatic helical insert tool comprising

a frame,

a motor on said frame having an insert driving head thereon,

a feed strip having a plurality of drive notches therein,

a plurality of inserts in said feed strip,

a circular magazine on said frame having a rotatable spool therein for supporting said feed strip,

a feed dial having teeth engageable in the notches in said feed strip,

a manually operable trigger,

mechanical means comprising an index gear having ratchet teeth thereon rotatable with said feed dial, and a pawl actuatable by said trigger and engageable with said ratchet teeth, said means being actuatable upon a predetermined first increment of travel of said trigger in one direction for advancing said feed dial and one insert on said feed strip to a drive position in alignment with the tool on said motor each time said trigger is pulled, and

control means for said motor energizable upon a predetermined travel of said trigger in said one direction to energize said motor to advance said tool into engagement with an insert and advance said insert into a workpiece.

4,449,284

METHOD OF MANUFACTURING AN INTEGRATED CIRCUIT DEVICE HAVING VERTICAL FIELD EFFECT TRANSISTORS

Masafumi Shimbo, Tokyo, Japan, assignor to Seiko Instruments & Electronics Ltd., Tokyo, Japan

Filed Sep. 2, 1980, Ser. No. 183,064
Claims priority, application Japan, Aug. 30, 1979, 54-110891; Aug. 30, 1979, 54-110892
Int. Cl.³ H01L *21/95*
U.S. Cl. 29—571 **6 Claims**

1. A method of manufacturing an integrated circuit device including at least one vertical field effect transistor, comprising the steps of:

forming a first single crystal semiconductor layer of one conductivity type and of a low impurity density on a second single crystal semiconductor layer of one conductivity type and of a high impurity density;

depositing a masking film including a nitride over a whole surface of said first layer;

removing selected portions of said masking film while leaving at least first and second portions thereof intact where said second portion circumscribes said first portion;

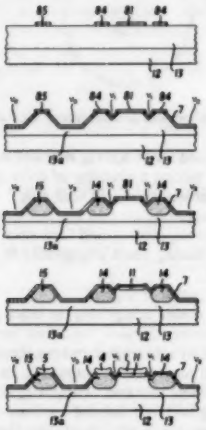
forming a first recess between said first and second portions of the masking film and a second recess at least partially outside of said second portion of the masking film in said first layer by use of said masking film at least as a mask for etching said first layer;

selectively oxidizing the exposed surface of said first layer by use of the intact masking film;

forming a second single crystal region of opposite conductivity type to said one conductivity type in said first layer through the window opened by removing an insulator film of said second portion of the masking film; and

forming a first single crystal region of one conductivity type and of a high impurity density in said first layer through the window opened by removing an insulator film of said first portion of the masking film;

whereby a transistor is formed by using said first layer, said second layer, said first region and said second region as the channel region, source region, drain region and the gate region, respectively, of the transistor.



5. A method of manufacturing an integrated circuit device including at least one vertical field effect transistor as claimed in claim 1; comprising the steps of:

forming said first layer on said second layer;

depositing said masking film on said first layer;

removing selected portions of said masking film while leaving at least said first and second portions and a third portion thereof intact where said third portion is formed spaced from the outside of said second region;

forming said first and second recesses and a third recess between said second and third portions of the masking film in said first layer;

selectively oxidizing the exposed surface of said first layer by use of said intact masking film;

forming said second region and a third region of said opposite conductivity in said first layer thorugh the windows opened by removing an insulator film of said second and third portions of the masking film; and

forming said first region;

whereby said transistor and a lateral transistor are formed, the latter of which is composed of said third region as an emitter or an injector, said first layer as a base, said second layer as a base electrode region and said second region as a collector.

4,449,285

METHOD FOR PRODUCING A VERTICAL CHANNEL TRANSISTOR

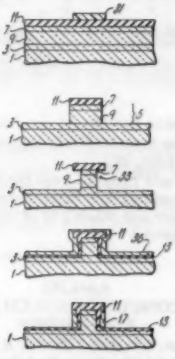
Timothy W. Janes, Worcester, and John C. White, Malvern, both of England, assignors to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed Jul. 12, 1982, Ser. No. 397,342

Claims priority, application United Kingdom, Aug. 19, 1981, 8125375

Int. Cl.³ H01L *21/20, 21/285, 21/302*

U.S. Cl. 29—571 **5 Claims**



1. A method for producing a vertical channel transistor, the method including the following steps:

providing a semiconductor substrate, and forming a steep-walled mesa of semiconductor material, the mesa having over its upper surface a thick layer of insulating material;

undercutting mesa material beneath the layer of insulating material;

forming a thin insulating layer over the mesa side walls and over the substrate material;

depositing conductive material over the insulated mesa and substrate, backfilling thereby the undercut region of the mesa; and

ion beam milling the mesa and substrate to remove excess conductive material, to leave a vertical insulated gate electrode in the undercut region of the mesa.

4,449,286

METHOD FOR PRODUCING A SEMICONDUCTOR LAYER SOLAR CELL

Reinhard Dahlberg, Flein, Fed. Rep. of Germany, assignor to Licentia Patent-Verwaltungs GmbH, Frankfurt am Main, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 169,128, Jul. 15, 1980, abandoned. This application Oct. 27, 1981, Ser. No. 315,641

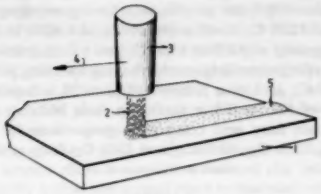
Claims priority, application Fed. Rep. of Germany, Oct. 17, 1979, 2941908

Int. Cl.³ H01L *31/18*; B05D *1/00*

U.S. Cl. 29—572 **22 Claims**

1. In a method for producing a semiconductor layer solar cell by applying a semiconductor layer to a substrate by plasma spraying, in which a semiconductor material is brought out of the plasma zone of the plasma spraying means, the improvement comprising maintaining the energy density in the plasma zone sufficiently high such that the semiconductor vaporizes and is brought out of the plasma zone in the form of a vapor jet,

and condensing the vapor jet on the substrate in the form of a semiconductor layer.



13. Method as defined in claim 1, additionally comprising providing a pn-junction near the surface on one side of the semiconductor layer.

4,449,287

METHOD OF PROVIDING A NARROW GROOVE OR SLOT IN A SUBSTRATE REGION, IN PARTICULAR A SEMICONDUCTOR SUBSTRATE REGION

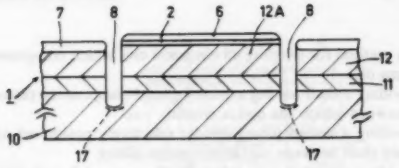
Henricus G. R. Maas, and Johannes A. Appels, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

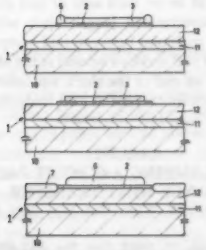
Filed Dec. 8, 1982, Ser. No. 447,844

Claims priority, application Netherlands, Dec. 10, 1981, 8105559

Int. Cl.³ H01L *21/302*

U.S. Cl. 29—580 **20 Claims**





1. A method of providing a narrow groove in a substrate region, the width of the groove being determined in a self-aligning manner, characterized in that on a surface of the substrate region there is provided at least a first oxidation-preventing layer and on this layer an oxidizable layer, in that the oxidizable layer is removed selectively above part of the surface of the substrate region, whereupon an edge portion of the remaining part of the oxidizable layer is selectively oxidized throughout its thickness and the remainder of the oxidizable layer is selectively oxidized at most only through part of its thickness, and in that then at least the uncovered part of the first oxidation-preventing layer is selectively removed, the exposed part of the substrate region is thermally oxidized through part of its thickness and the substrate region is exposed in a self-aligning manner substantially only at the area of the oxidized edge portion and is etched away through at least part of its thickness to obtain the groove, the said remaining part of the oxidizable layer inclusive of the oxidized edge portion being removed.

4,449,288

PROCESS FOR MAKING A WINDING FOR A LOW-POWER ALTERNATOR STATOR

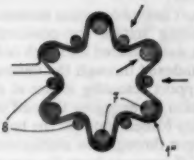
Jacques Disclaire, Charbonnieres, and Claude Mignotte, Saint Priest, both of France, assignors to Societe de Pariset du Rhone S.A., Lyons, France

Filed May 27, 1981, Ser. No. 267,452

Claims priority, application France, May 30, 1980, 80 12475

Int. Cl.³ H02K *15/06*

U.S. Cl. 29—596 **4 Claims**



1. A process for making the winding of a stator, more especially an alternator stator for motor vehicles, comprising the steps of:

forming a flat circular coil having a desired number of turns externally of the stator for each phase of said alternator,

preforming the coil externally of the stator into an undulating star shape with the undulations corresponding to the number of poles and notches of the stator,

maintaining the coil in its substantially flat shape during said preforming step,

inserting said coil into the notches of said stator, and

preforming said inserting step by tilting selected portions of said preformed star shaped coil out of the plane of flatness of said coil established during said forming and preforming steps towards the other end face of said stator.

4,449,289

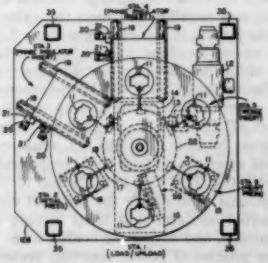
AUTOMATIC SYSTEM AND METHOD FOR COMPRESSING COIL TURNS AND INSERTING INSULATORS IN SLOTS OF A SLOTTED STATOR CORE

Alan L. Kindig, Holland, Mich., assignor to General Electric Company, Fort Wayne, Ind.

Continuation of Ser. No. 173,052, Jul. 28, 1980, abandoned. This application Apr. 5, 1982, Ser. No. 365,936

Int. Cl.³ H05K *15/10*

U.S. Cl. 29—596 **29 Claims**



1. An automatic system for compressing coil turns and in-

serting insulators in stator slots of a dynamoelectric machine comprising:

a movable worktable having a plurality of stator holding stations spaced about the worktable, the stators initially including slot liners terminating in end cuffs projecting from each end face of the stator and at least a first set of windings loosely inserted in the stator slots;

a plurality of work stations spaced about the worktable including (a) a combined loading/unloading station, (b) an initial press station for compressing coil turns in the stator slots and for clearing coil end turns from the vicinity of the stator bore, (c) at least one winding insulation insertion station, and (d) a heavy press station for further compressing the coil turns with the inserted insulation in the stator slots;

means for actuating the worktable to index the holding stations sequentially through the work stations in a repetitive manner;

a cuff support assembly means mounted on the worktable at each holding station for positioning and irremovably holding a stator loaded into each holding station while the stator is indexed through the various work stations;

and cuff support actuating means at the loading/unloading work station for engaging the cuff supports with the cuffs of a freshly loaded stator at the beginning of the indexing of the stator through the work stations and for disengaging the cuff supports from the stator cuffs after the stator has indexed through all the work stations so that the stator may be unloaded and a new stator loaded into the holding station.

4,449,290

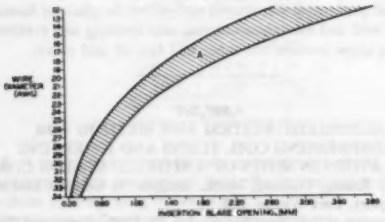
POWER INSERTABLE NYLON COATED MAGNET WIRE

Hollis S. Saunders; Richard V. Carmer, and Lionel J. Payette, all of Fort Wayne, Ind., assignors to Essex Group, Inc., Fort Wayne, Ind.

Division of Ser. No. 312,214, Oct. 19, 1981, Pat. No. 4,410,592. This application Jun. 29, 1983, Ser. No. 508,786

Int. Cl.³ B32B *27/00*; H01B *7/00*

U.S. Cl. 29—596 **13 Claims**



1. A method of coating an electrically insulated magnet wire having an outer coating of nylon insulation comprising applying aliphatic hydrocarbon solvent solution of hydrogenated triglyceride and paraffin wax onto the nylon insulation, the paraffin wax present in the solution at about 0.1% to about 4% by weight having a melting point of 50° C. to 52.8° C., a refractive index of 1.4270 at 80° C., a specific gravity of 0.839 at 15.6° C., and a flash point of 212.8° C., the hydrogenated triglyceride present at about 0.1% to about 10% by weight, having a melting point of 47° C. to 50° C., an Iodine Number of 22 to 35, a Saponification Number of 188 to 195, a maximum Acid Number of 5 and approximate fatty acid component proportions of 8% C_{14}, 34% C_{16}, 27% C_{18}, 16% C_{20} and 15% C_{22} fatty acids, in such amounts as to enable the resultant coated wire to be power inserted into coil slots in its locking wire size range without damage, and drying the coated wire.

8. In the process of power inserting prewound lubricated magnet wire into coil slots with substantially no evidence of wire damage in subsequent surge failure testing, the improvement comprising reliably power inserting magnet wire in the locking wire size range having an outer layer of nylon insulation coated with an external lubricant mixture of paraffin wax and hydrogenated triglyceride in a ratio by weight of about 1:30 to about 30:1, the paraffin wax having a melting point of 50° C. to 52.8° C., a refractive index of 1.4270 at 80° C., a specific gravity of 0.839 at 15.6° C., and a flash point of 212.8° C., the hydrogenated triglyceride having a melting point of 47° C. to 50° C., an Iodine Number of 22 to 35, a Saponification Number of 188 to 195, a maximum Acid Number of 5 and approximate fatty acid component proportions of 8% C_{14}, 34% C_{16}, 27% C_{18}, 16% C_{20} and 15% C_{22} fatty acids.

4,449,291

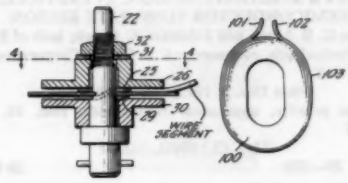
METHOD OF MAKING A MULTIPLE LAYER COIL WINDING SYSTEM

Irwin L. Rothman, Goshen, N.Y., assignor to Loral Corporation, Yonkers, N.Y.

Filed Nov. 4, 1981, Ser. No. 318,399

Int. Cl.³ H01F *7/06*

U.S. Cl. 29—605 **3 Claims**



1. A method for winding an electrical coil which comprises the steps of:

providing a shaft having a pair of spaced compression plates between which the coil is wound;

providing a slotted planar divider selectively positioned on said shaft between said compression plates;

providing a predetermined length of wire used for winding a coil, and determining its substantial midpoint;

engaging said wire upon said slotted divider so that a segment of wire will lie on each side of said divider; and

winding said predetermined length upon said shaft commencing at said midpoint between said compression plates to form a pair of coil sections wound in the same direction, as viewed from an end of the shaft, and interconnected at the inner peripheries thereof at said midpoint.

4,449,292

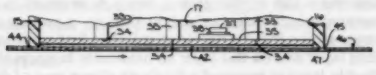
METHOD OF CLAMPING A CIRCUIT PACKAGE TO ENHANCE HEAT TRANSFER

Lance R. Kaufman, 131 W. White Oak Way 96N, Mequon, Wis. 53092

Filed Mar. 26, 1982, Ser. No. 362,498

Int. Cl.³ H01B *19/00*

U.S. Cl. 29—631 **5 Claims**



1. A method to form a compact circuit package with improved construction for clamping to enhance heat transfer, comprising the steps of

forming an insulating housing with a circuit retaining cavity substantially surrounded by a peripheral side wall including a wall portion terminating at a rim located substantially within a first plane,

providing said housing with means to limit the depth of entry into said cavity,

placing a heat conducting electrically insulating substrate into engagement with said depth limiting means to substantially enclose said cavity with a first side of said substrate facing said cavity and containing a heat generating electrical component and a second oppositely disposed side located substantially within a second plane spaced from said first plane so that said rim extends outward from said substrate second side, and

removing an outer portion of said rim substantially along said second plane to provide a reduced rim located substantially within said second plane so that said reduced rim and said second substrate side form a clamping surface to be clamped to an external heat dissipating object to permit increased substantial clamping pressure without damaging said substrate and said side wall.

4,449,293

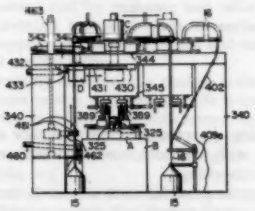
COIL WINDING AND INSERTING MACHINE

Fumikazu Itoh, Fujisawa; Yasuhiro Fujita, Yokosuka; Takashi Kobayashi, Fujisawa, and Takao Mifune, Ichikawa, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 8, 1982, Ser. No. 338,075

Int. Cl.³ H02K *15/06*

U.S. Cl. 29—736 **5 Claims**



1. A coil winding and inserting machine in which flyers are rotated around winding forms constituted by tooling blades arranged on a circle and auxiliary plates disposed at an outer side of said tooling blades to thereby wind multiphase coils, each phase having N poles, around said winding forms, and the coils are directly inserted into a stator core from said tooling blades together with wedges, said coil winding and inserting machine comprising:

an inserter tooling means for forming the winding forms for individual phases of the coils during a coil winding, said inserter tooling means including a plurality of independently liftable tooling blades and a plurality of independently liftable auxiliary plates arranged around said tooling blades, each of said winding forms being formed by two tooling blades and at least one auxiliary plate in a lifted position; and

a winding means including a rotatably indexable supporting means for supporting said flyers arranged at a 120° interval on a circle centered at an axis of rotation of said supporting means so as to oppose said winding forms, said flyers being rotatable simultaneously and independently, whereby the winding of coils for a first pole of each phase is effected by independently rotating said flyers simultaneously or sequentially, and the winding for the Nth pole of each phase is effected after an indexing rotation of said supporting means by an angle which is obtained by dividing 360° by the number of poles.

4,449,294

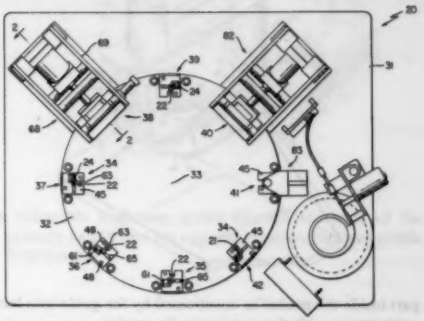
APPARATUS FOR JOINING TWO ABUTTING METAL MEMBERS TOGETHER AND METHOD OF MAKING SUCH APPARATUS

James C. Gunter, Greensburg, Pa., assignor to Robertshaw Controls Company, Richmond, Va.

Filed Apr. 28, 1982, Ser. No. 372,630

Int. Cl.³ B23P *11/00, 19/00*; B23Q *7/00*

U.S. Cl. 29—792 **30 Claims**



1. In an apparatus for joining two metal members together with a lancing and staking operation that comprises the lancing and forming of a part of one of said members through an unblanked part of the other of said members and thereafter the staking of said formed part of said one member to an adjacent surface means of said other member to secure said members together in abutting relation, said apparatus having a punch and a reciprocating head that cooperate together to perform said lancing and staking operation on said members, the improvement comprising an indexible carrier means for indexing said members to said head for said lancing and staking operation thereon and then away from said head after said lancing and staking operation, said carrier means supporting and carrying said punch therewith whereby said punch moves with said carrier means relative to said head.

4,449,295

DEVICE TO INSTALL DRAPERY HOOKS

Alfred Alexander, Jr., Westport, Mass., assignor to Robertson Factories, Inc., Taunton, Mass.

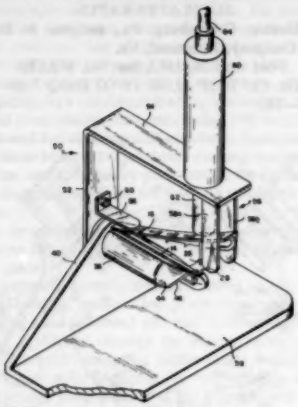
Filed Jun. 28, 1982, Ser. No. 393,106

Int. Cl.³ B23P *19/00, 11/00*; B25B *27/14*

U.S. Cl. 29—798 **8 Claims**

1. A device for attaching hangers to drapes of the kind having a pleated top defining transverse spaced pockets for receiving hangers embodying interengageable parts, comprising an anvil dimensioned to be received within a pocket, said anvil containing a groove within which one of the parts of the hanger can be positioned such that said one part is disposed within the pocket and the other is disposed outside the pocket, means defining constraining guides positioned above the anvil for receiving the other of the parts outside the pocket and holding it in alignment with the limb inside the pocket and a

driver supported for movement toward the anvil in a direction to force the part outside the pocket rectilinearly toward the



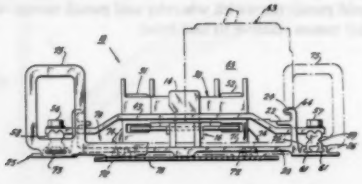
part inside the pocket as constrained by the guide into locking engagement with the part inside the pocket.

4,449,296

METHOD OF FORMING ELECTRIC DISTRIBUTION PANEL

Roger D. Luke, Norcross, and John M. Rhodes, Atlanta, both of Ga., assignors to Siemens-Allis, Inc., Atlanta, Ga.

Continuation of Ser. No. 920,153, Jun. 29, 1978, abandoned.
This application Dec. 17, 1979, Ser. No. 104,101
Int. Cl.³ H01R *43/00*
U.S. Cl. 29—883 **3 Claims**



1. A method for forming an electrical power distribution device comprising the steps of:

forming a base by extruding insulating plastic material flowing in an extruding direction;

simultaneously forming both circuit breaker and neutral bus mounting means integrally with said base during said extrusion step, said circuit breaker mounting means extending in said extruding direction and being adapted to support circuit breakers when the latter are operatively mounted to said device, said neutral bus mounting means including first and second channels extending in said extruding direction and being adapted to slidably receive first and second neutral bus bars, respectively;

slidably inserting said first and second neutral bus bars into said first and second channels, respectively;

and

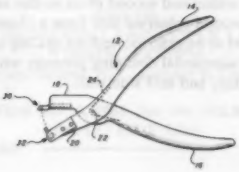
securing a main bus bar having a line contact array connected thereto to the front of said base, said line contact array being adapted to engage said circuit breakers when the latter are operatively mounted to said device.

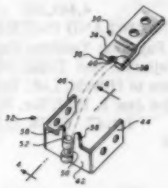
4,449,297

CLIPPING APPARATUS

Dorothy J. Fuchs, and Francis J. Fuchs, Jr., both of 593 104th Ave., Naples, Fla. 33940

Filed Sep. 30, 1982, Ser. No. 431,228
Int. Cl.³ A45D *29/00*
U.S. Cl. 30—29 **1 Claim**





1. Clipping apparatus for clipping a claw and for providing said claw with a smooth contoured surface in the plane of clawing, comprising:

a first cutter provided with a smooth, contoured shearing edge, said first cutter including a generally planar member having a front edge provided with an inclined surface into which is formed an inwardly extending cylindrically shaped surface the bottom edge of which is generally circular;

a second cutter provided with a smooth, contoured shearing surface complementary in configuration to said shearing edge, said second cutter including a generally U-shaped member having a base and legs, the legs extend inwardly and are spaced apart a predetermined distance to permit said first cutter to enter therebetween, the base portion of said U-shaped member provided at its center with an upwardly extending generally cylindrically shaped post having a generally flat circular upper surface;

said U-shaped member provided with a pair of upwardly extending safety membes on either side of said post, said safety members spaced from said post a predetermined distance to prevent said claw from being inserted therebetween a distance sufficient to cause said blood vessel to be sheared upon said clipping; and

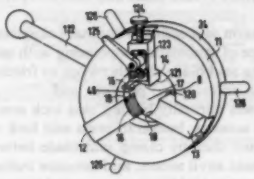
upon said claw being placed between said shearing edge and said shearing surface and oriented such that the shearing surface is in said plane of clawing and upon said shearing edge being advanced towards and into engagement with said shearing surface, said shearing edge and said shearing surface cooperate to shear and clip said claw and provide said claw with said smooth contoured surface in said plane of clawing.

4,449,298

HAND-OPERATED APPARATUS FOR PEELING OFF THE OUTER JACKET LAYER OF ELECTRIC LINES AND CABLES

Wilhelm Putz, Kersbach, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jul. 12, 1982, Ser. No. 397,441
Claims priority, application Fed. Rep. of Germany, Jul. 22, 1981, 3129014; Apr. 19, 1982, 3214479
Int. Cl.³ H02G 1/12
U.S. Cl. 30—90.1 13 Claims



1. In a hand-operated device for peeling off the outer jacket layer of an electric cable, said device having an adjustable peeling knife which can be adjusted to the diameter of the cable, the improvement comprising:

support disc means having an aperture therein for receiving said cable and operating handle means for turning said support disc means fastened thereto;

guide means having three radially adjustable guide jaws movably mounted to said support disc means and directed toward the center of said aperture, each of said guide jaws having a concave end for engaging said cable, said concave end having a truncated threaded surface so that when said support disc means is turned said cable will be fed into said peeling knife;

means for adjustably fastening the peeling knife to one of said guide jaws so that said peeling knife is continuously movable in the radial direction with respect to said guide jaw and the cutting edge of said peeling knife can be extended past said concave end of said guide jaw to cut into said cable; and

rotatable adjusting disc means adjacent said support disc means and having an aperture therein for receiving said cable disposed in alignment with said aperture in said support disc means, said adjusting disc means including a spiral slot for each guide jaw engaging said guide jaw so that each said guide jaw is radially adjustable to the diameter of said cable;

whereby when said operating handle means is turned around said cable, said peeling knife engages the outer jacket of said electric cable and peels said outer jacket from said cable.

4,449,299

COMBINATION SCRAPING PLANE

James F. Mulrooney, R.F.D. 2 Box 279, Epping, N.H. 03042

Filed Sep. 28, 1981, Ser. No. 306,365
Int. Cl.³ B27G 17/00
U.S. Cl. 30—169 9 Claims

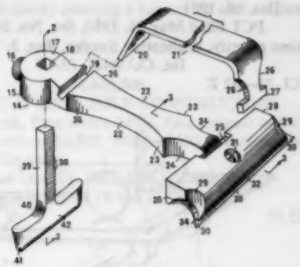
1. In hand tools, a combined plane and scraper comprising:

a primary handle constructed to conform to the shape of the hand of the user;

a blade adjustably secured to one end of the primary handle provided with a tensioning means for the blade, the cutting edge of which blade extends below the bottom of the handle and beyond the end of the handle and which blade is acutely angled downwardly from the horizontal centerline of the primary handle;

a vertical opening through the primary handle near the non-blade end thereof;

a convertible foot/handle which is adjustably secured within the vertical opening in the primary handle, wherein the convertible foot/handle protrudes above the main body of the primary handle to form an auxillary facilitating handle;



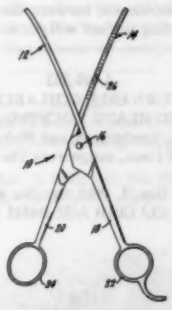
an adjustable tightening means through the body of the primary handle into the opening to secure the convertible foot/handle.

4,449,300

HAIR TRIMMING SHEARS

Susan D. Maledon, 1224 Warrington, Deerfield, Ill. 60015

Filed Nov. 19, 1981, Ser. No. 323,138
Int. Cl.³ B26B 13/00
U.S. Cl. 30—230 5 Claims



1. A pair of hair trimming shears comprising:

two pivotally connected shear blades, each blade having a plurality of cutting teeth of generally triangular cross-sectional configuration extending across the surface of the blade facing the other blade and projecting outwardly of that surface toward the other blade, the teeth of each blade being aligned with the inter-teeth spaces in the other blade in one-for-one relation for meshing engagement of the teeth on the two blades when the blades are closed on each other,

the teeth on each blade being of varying cross-sectional configurations such that each tooth has a different cross-sectional configuration from any adjacent tooth on the blade to afford a non-uniform zig-zag trim cut.

4,449,301

APPARATUS AND METHOD FOR DRAWING CURVES

Bo G. Backman, Vesslingegatan 11, 711 00 Lindesberg, Sweden

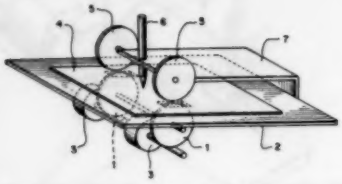
PCT No. PCT/SE81/00154, 371 Date Jan. 26, 1982, 102(e) Date Jan. 26, 1982, PCT Pub. No. WO81/03561, PCT Pub. Date Dec. 10, 1981

PCT Filed May 26, 1982, Ser. No. 346,031

Claims priority, application Sweden, Jun. 3, 1980, 8004140

Int. Cl.³ B43L *13/00*

U.S. Cl. 33—32 E **18 Claims**



1. An apparatus for drawing curves on a recording surface, the apparatus comprising:

a chassis having a first side and a second side;

first and second wheels;

means for rotatively mounting the first wheel to the first side of the chassis and for rotatively mounting the second wheel to the second side of the chassis such that said first and second wheels rotate about a common axis;

first and second stepper motors mounted on the chassis for rotatively driving a respective one of said first and second wheels;

a drawing implement having an operative end abutting the recording surface at a contact point; and

means for mounting said drawing implement to the chassis such that when said first and second wheels are both driven at a first selected rate in an opposite direction, a change of angle will occur between the common axis and the recording surface with a center of rotation at the contact point, and when said first and second wheels are both driven at a second selected rate in an identical direction, a linear movement between the drawing implement and the recording surface will occur.

4,449,302

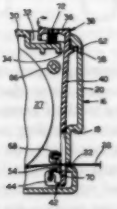
POWER RETURNABLE COILABLE RULE WITH IMPROVED BLADE LOCKING ASSEMBLY

Mark A. Drechsler, Southington, and Walter J. Hutchins, West Hartford, both of Conn., assignors to The Stanley Works, New Britain, Conn.

Filed Dec. 7, 1982, Ser. No. 447,681

Int. Cl.³ G01B *3/10*; B65H *75/48*

U.S. Cl. 33—138 **26 Claims**



1. In a power returnable coilable rule, the combination comprising:

A. a casing having a pair of spaced end walls and a sidewall extending peripherally thereabout, said end and side walls defining a chamber therewithin, said sidewall having a blade passage therethrough to said chamber and a locking means aperture therethrough spaced from said blade passage;

B. a coiled blade within said chamber of said casing and extending outwardly of said casing through said blade passage;

C. blade locking means movable in said chamber of said casing including (1) an elongated lock arm extending along said sidewall between said blade passage and locking means aperture, and having an aperture therein through which said blade extends, (2) an actuator button at the end of said lock arm adjacent said locking means aperture and disposed outwardly of said casing for movement relative thereto, (3) and lock means at the other end of said lock arm engageable with the surface of said blade disposed away from said actuator button;

D. anvil means on said casing within said chamber adjacent the other surface of said blade cooperating with said lock means for clamping said blade therebetween to frictionally engage said blade in an extended position; and

E. biasing means normally biasing said lock arm in the direction of said actuator button to press said lock means against said blade and thereby clamp said blade between said lock means and said anvil means, said actuator button being movable to overcome said biasing means and move said lock arm longitudinally in the direction away from said actuator button and said lock means away from said blade and thereby release said blade for movement freely inwardly and outwardly of said casing.

4,449,303

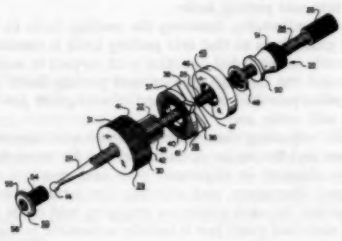
SIGHTING SCREW UNIT FOR AND WITH ARCHERY BOWS

Marlow W. Larson, 2735 S. 4050 West, Ogden, Utah 84401

Filed Apr. 28, 1983, Ser. No. 489,500

Int. Cl.³ F41G *1/00*

U.S. Cl. 33—265 **12 Claims**



1. A sighting screw unit for archery bows, said sighting screw unit including, in combination: a sighting screw having a manually graspable end, a sighting bead, and a threaded shank integrally disposed therebetween; adjustment means threadedly mounted upon said threaded shank and having a graspable rotatable knob and an axially projecting pinion of less radial dimension than said knob; a backing washer having a splined recess constructed to keyingly engage said pinion, said washer being provided with a central bore the surace of which frictionally engages said threaded shank; and nut means backing said washer.

4,449,304

DRAWING INSTRUMENT AND LOCKING APPARATUS THEREFOR

Ronald E. Underwood, South Somerville, N.J., assignor to Binney & Smith Inc., Easton, Pa.

Filed Jan. 24, 1983, Ser. No. 460,150

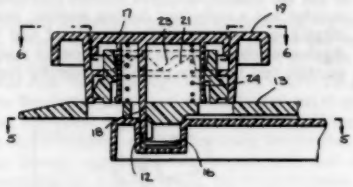
Int. Cl.³ B43L *5/02, 13/14*

U.S. Cl. 33—437 **12 Claims**

1. A drawing instrument displaceable on a flat surface having a groove therein comprising:

an elongated member having a straight edge and having at least one protrusion on the bottom surface thereof for seating in the groove of the flat surface;

a displaceable member mounted on said elongated member and displaceable into the groove in a depressed condition and out of the groove in a raised condition and in said depressed condition having a wall cooperative with said protrusion to engage the groove to lock the instrument in position by a friction fit of said protrusion and said wall in the groove,



an outer ring member rotatably mounted on said elongated member and freely rotatable through 360 degrees around said displaceable member when said displaceable member is in said raised condition and including means for engaging said displaceable member when said displaceable member is in said depressed condition upon rotation of said ring member to raise said displaceable member by applying thereto a force overcoming said friction fit;

and spring means for maintaining said displaceable member in said raised condition until said displaceable member is depressed.

4,449,305

FREEZE-DRYING APPARATUS

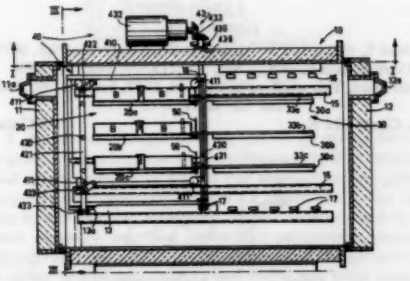
Michel Baron, Plaisir, and Philippe Larrat, Beynes, both of France, assignors to Societe d'Utilisation Scientifique et Industrielle du Froid Usifroid, Maurepas, France

Filed Jun. 17, 1982, Ser. No. 389,405

Claims priority, application France, Jul. 1, 1981, 81 12926

Int. Cl.³ F26B *13/30, 5/06*

U.S. Cl. 34—92 **8 Claims**



1. Apparatus for freeze-drying products contained in vessels, the apparatus comprising:

an enclosure defining a single compartment;

a plurality of freezing shelves and heating shelves housed within said enclosure and arranged in two separate groups;

cooling means thermally coupled to said freezing shelves to maintain said freezing shelves at a temperature below 0° C. during operation of said freeze-drying apparatus;

heating means thermally coupled to said heating shelves to maintain said heating shelves at a temperature above 0° C. during operation of said freeze-drying apparatus;

means for transferring the vessels containing the products to be freeze-dried from the freezing shelves to the heating shelves; and

means for selectively creating a vacuum in said single compartment.

4,449,306

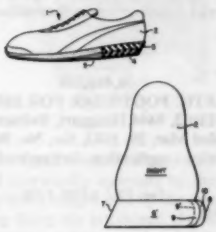
RUNNING SHOE SOLE CONSTRUCTION

Peter R. Cavanagh, Pine Grove Mills, Pa., assignor to PUMA-Sportschuhfabriken Rudolf Dassler KG, Herzogenaurach, Fed. Rep. of Germany

Filed Oct. 13, 1982, Ser. No. 434,047

Int. Cl.³ A43B *13/04, 13/12, 13/18*

U.S. Cl. 36—30 R **20 Claims**



1. A running shoe sole construction comprising a cushioning sole layer having a midsole layer and a heel lift portion, and an outer sole layer covering the bottom of the cushioning sole layer, said midsole layer and heel lift portion being formed of resilient cushioning material and said outer sole layer being formed of a relatively hard, wear-resistant material, wherein the circumferentially-extending border of the sole construction is provided with a convexly curved shape having a relatively large radius of curvature located along at least a heel area of an outer, longitudinally-extending, side of the cushioning sole layer and is provided with a flaring or the like at an inner longitudinally-extending side of the cushioning sole layer.

4,449,307

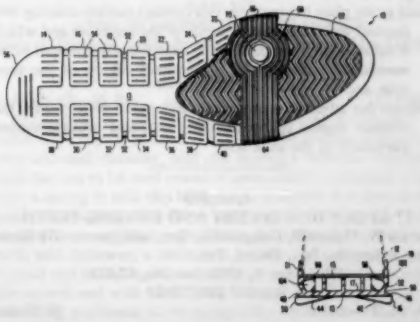
BASKETBALL SHOE SOLE

Jerry D. Stubblefield, Portland, Oreg., assignor to Pensa, Inc., Tigard, Oreg.

Filed Apr. 3, 1981, Ser. No. 250,899

Int. Cl.³ A43B *13/04, 13/18, 5/00*

U.S. Cl. 36—32 R **20 Claims**



1. An outer sole for a shoe comprising:

an inner surface having a central portion and a peripheral portion;

an outer surface having a central portion and a peripheral portion;

a side wall formed on said peripheral portion of said inner surface, said side wall having a downwardly and inwardly inclined lower portion;

substantially rigid pedestal means formed on said central portion of said inner surface;

cavity means extending along said peripheral portion of said inner surface;

a plurality of resilient tread members extending downwardly and outwardly from said peripheral portion of said outer surface, each of said tread members including a downwardly and outwardly inclined upper wall; and

a groove formed by said inclined upper walls of said tread members and said inclined lower portion of said side wall;

wherein said cavity means and said groove facilitate flexing of said tread members upon foot-induced impact with a surface.

4,449,308

ATHLETIC FOOTWEAR FOR BICYCLISTS

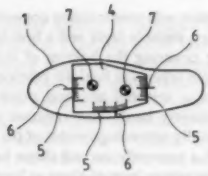
Hugo Schär, Hilti 2, 8444 Henggart, Switzerland

Filed Mar. 29, 1982, Ser. No. 363,076

Claims priority, application Switzerland, Apr. 16, 1981, 2542/81

Int. Cl.³ A43B *5/00*

U.S. Cl. 36—131 **16 Claims**



1. A sport shoe for a bicyclist, especially for a bicycle racer and used with a bicycle pedal having a lengthwise direction of extent, comprising:

a shoe sole having a contact region intended to come into contact with a bicycle pedal and possessing a substantially arcuate-shaped curvature which is substantially constant over the extent of said contact region in order to enable the bicyclist to carry out adjustments of the sport shoe in lengthwise direction relative to the lengthwise direction of extent of the bicycle pedal;

a guide plate;

said guide plate having a curved contact surface coming into contact with the contact region of the shoe sole and which is substantially identical to the substantially constant arcuate-shaped curvature of the contact region of the shoe sole; and

means for adjustably mounting said guide plate within the contact region of substantially constant arcuate-shaped curvature of the shoe sole.

4,449,309

FLAT BOTTOM BUCKET AND DIGGING TEETH

Charles W. Hemphill, Duncanville, Tex., assignor to GH Hensley Industries, Inc., Dallas, Tex.

Filed Mar. 5, 1979, Ser. No. 17,443

Int. Cl.³ E02F *9/28*

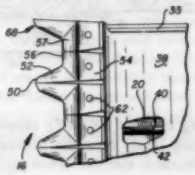
U.S. Cl. 37—141 R **18 Claims**

1. A digging bucket having spaced sides, a rear wall, and a flat bottom which lies in a plane at the forward marginal end thereof and then curves into joined relationship respective to the rear wall;

the sides and rear wall are joined together and to the bottom, with the bucket having an opening defined by the edges of a peripheral wall surface which includes the edges of the spaced sides and rear wall;

the forward marginal end of the bottom is in the form of a tooth supporting lip, lift means attached to the bucket by which the bucket can be manipulated;

said lip having opposed ends joined to said spaced sides, a plurality of teeth, means by which said teeth are mounted to the lip, each of said teeth includes a primary digging member and a secondary digging member, said primary digging member extends in advance of said secondary digging member; adjacent teeth are mirror images of one another; said teeth are positioned laterally respective to



one another and substantially abut each other; the primary digging members of some adjacent teeth abuttingly engage one another and cooperate together to present a single forward directed digging member; the secondary digging members of other adjacent teeth abuttingly engage one another and cooperate together to present a rearward cutting edge which lies rearwardly of the single forward directed digging member; the cutting edges of said forwardly directed digging member and said rearward cutting edge jointly cooperate together to form a continuous cutting edge which extends across the entire width of the bucket;

so that when the bucket is moved in a forward direction, the teeth can jointly engage and remove material from the earth and cause the removed earth to be received within the bucket; while the forward edge of the bucket lip is precluded from engaging the ground.

4,449,310

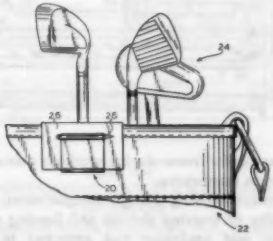
GOLF CLIP

Michael S. Kline, 166 N. Middaugh St., Somerville, N.J. 08876

Continuation-in-part of Ser. No. 215,539, Dec. 11, 1980, abandoned. This application Jun. 24, 1982, Ser. No. 391,545

Int. Cl.³ G09F *3/18*

U.S. Cl. 40—11 R **6 Claims**



1. A golf clip for a golf bag containing golf clubs comprising; an elongated strip of spring material, the strip being formed into a configuration including a first leg having a free end and bent at the other end into a second leg overlying the first leg to

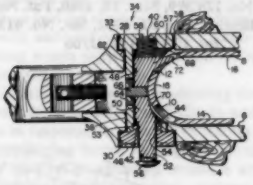
form a mounting recess to receive the upper end of the golf bag therebetween, the configuration of the mounting recess conforming to the configuration of the upper end of the golf bag and insertion of the golf bag into the recess will force the first and second legs apart whereby the tendency to return to the relaxed configuration will resiliently mount the clip on the golf bag, the second leg being bent at the end opposite to the end connected to the first leg to form a third leg overlying the second leg on the side opposite to the side forming the first leg, the second and third legs being resiliently displaceable from one another to permit insertion of a golf score card therebetween and to hold the score card in position, the end of the third leg opposite to the end connected to the second leg being bent into a hollow tubular configuration to receive and retain a marking implement for the score card therein, the third leg being shorter than the second leg to provide access to the golf card held in the clip for marking of indicia thereon and to space the marking implement from the upper end of the golf bag on which the clip is mounted, the first leg being shorter than the second leg thereby minimizing interference with golf club selection with respect to the golf bag, the recess between the second and third legs for holding the golf card being open at both side edges to permit use of the clip with a variety of different size golf cards, the third leg having a reduced diameter width with respect to the second leg so as to provide at least one spaced marginal edge part at the bend connecting the second leg to the third leg, and an aperture in each of the spaced marginal edge parts so as to permit partial insertion of a golf tee therein to hold the golf tee in position on the clip and permit removal of the golf tee for use.

4,449,311

REVERSIBLE MAGAZINE LATCH SYSTEM FOR PISTOLS

Paul S. Giragosian, 66 Lake St., Arlington, Mass. 02174

Filed Sep. 24, 1982, Ser. No. 423,323
Int. Cl.³ F41C *25/06*
U.S. Cl. 42—7 **6 Claims**



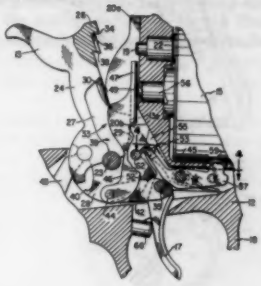
1. A reversible magazine latch system for pistols having a grip portion in which there is provided a cavity for a magazine, said system comprising a latch seat disposed in said pistol, a magazine latch assembly adapted for disposition in and retention by said seat, and a magazine adapted to be engaged by said latch assembly, said seat comprising an opening extending through said pistol and adapted to receive said latch assembly at either end of said opening and retain said latch assembly therein, said magazine having two lateral slots, a selected one of said slots being accessible to said latch assembly when said magazine is disposed in said cavity, said magazine latch assembly comprising a body portion having a first head portion on a first end thereof and a chamber therein, a second head portion threadedly connected to said body portion at a second end of said body portion, a latch portion movably disposed in said chamber, and detent means extending from said latch portion and through an opening in said body portion, said detent means being adapted to engage said selected one of said magazine slots.

4,449,312

MECHANISM ADAPTABLE FOR SINGLE ACTION REVOLVERS

William B. Ruger, Southport, and Roy L. Melcher, Stratford, both of Conn., assignors to Sturm, Ruger & Company, Inc., Southport, Conn.

Filed Oct. 20, 1981, Ser. No. 313,215
Int. Cl.³ F41C *17/04, 17/08, 1/00*
U.S. Cl. 42—66 **6 Claims**



1. In a firearm having a hammer, a trigger and a frame which hammer is rotated rearwardly manually by the operator to a cocked position without trigger pull by the operator and having a reciprocating firing pin positioned above the trigger in the frame to be struck in a forward direction by the hammer, the improvement comprising

(a) a trigger bar mounted on the trigger;

(b) trigger bar biasing means biasing the trigger bar rearwardly;

(c) the hammer having a front facing the frame and two sides substantially perpendicular to such front, the hammer being sized and shaped to include full-cock and loading notches and a plurality of front and side recesses, said recesses being defined by the exterior size and shape of the hammer front and sides and said exterior side recesses providing space for the trigger bar to rest in and to move into and out of as the trigger, hammer, and biasing means position the bar in rest, load, full-cock and fired positions; and

(d) a hammer projection on the front of the hammer in close proximity to the trigger bar in the load position

whereby the trigger bar is positioned substantially below the firing pin in the load position and is deformable if the hammer is dealt a substantial forward blow to move the hammer toward the frame and the trigger bar is positioned as high as and behind the firing pin in the full-cock position.

4,449,313

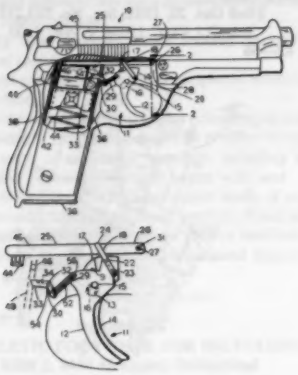
ANNUNCIATING TRIGGER DEVICE

John G. Hackett, 2414J Rustic Ridge, Overland, Mo. 63114

Filed Jul. 8, 1981, Ser. No. 281,357
Int. Cl.³ F41C *19/00*
U.S. Cl. 42—69 R **17 Claims**

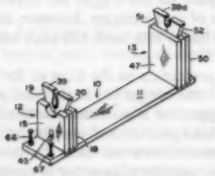
13. A firearm comprising a frame having a chamber for receiving a supply of ammunition into the firearm, a clip movable into said chamber, said clip having a follower engagable with the last to be used round of ammunition remaining in said clip, a spring in said clip biasing said follower in a direction to push ammunition into firing position in the firearm, a cam member on said follower projecting from the clip and movable with said follower, a deflection bar having a free end and a second end including connection means for pivotally engaging the second end with said frame, the free end of said deflection bar being positioned to be engaged by the cam member when a predetermined number of rounds of ammunition remain in said clip, said cam member pivotally moving said deflection

bar, a pair of adjacent trigger members mounted on said frame and movable between a normal position wherein said trigger members are in alignment and an annunciating position wherein said trigger members are angularly displaced relative to each other, a releasable catch engagable with at least one of



the trigger members for maintaining the trigger members in their normal aligned condition, and a tab member having a first portion engagable with said deflection bar and a second portion positioned to disengage said releasable catch from said one trigger member when the first portion of the tab is moved by engagement with the deflection bar.

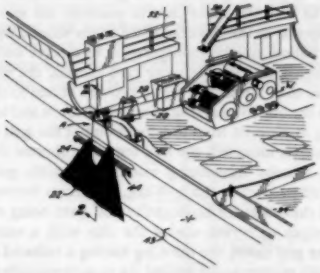
4,449,314
FIREARM SUPPORT
Richard L. Sorensen, Rte. 1, Box 182, Bandera, Tex. 78003
Filed Sep. 7, 1982, Ser. No. 415,665
Int. Cl.³ F41C *29/00*
U.S. Cl. 42—94 **7 Claims**



1. A firearm support comprising
an elongated base,
first and second transversely extending and longitudinally spaced support members on said base,
first and second asymmetrical and coacting wedges carried in said first support member,
first and second symmetrical and coacting wedges carried in said second support member,
said wedges in said first and second support members adapted to firmly grip selected parts of a firearm carried therein.

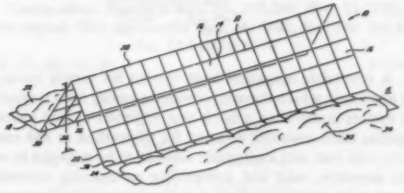
4,449,315
PURSE RING CONTROL APPARATUS FOR FISHING VESSELS
Mario J. Puretic, P.O. Box 58070, Tierra Verde, Fla. 33715
Filed Aug. 24, 1982, Ser. No. 410,934
Int. Cl.³ A01K *73/00*
U.S. Cl. 43—8 **15 Claims**

1. Apparatus for handling the purse rings of a net as such net is brought alongside a fishing vessel by the net's purse line, said purse rings being carried by said purse line, said apparatus comprising:
davit means mounted adjacent a sidewall of said vessel and having a free end supporting said purse line;
power-operated means to move the free end of said davit means between a first position wherein said free end extends outwardly of said vessel sidewall and a second position wherein said free end is disposed adjacent said vessel sidewall; and



purse ring support means mounted adjacent said vessel's sidewall below said davit means and movable between a retracted position when said davit means is in said second position and an extended position when said davit means is in said first position, whereby said support means temporarily supportingly engages said purse rings in said extended position for sequential removal of said purse rings from said support means.

4,449,316
SNAKE TRAP
Albert B. Moorhead, P.O. Box 413, Conroe, Tex. 77301
Division of Ser. No. 128,399, Mar. 10, 1980, Pat. No. 4,370,823.
This application Aug. 31, 1982, Ser. No. 413,565
Int. Cl.³ A01M *23/08*
U.S. Cl. 43—10 **3 Claims**



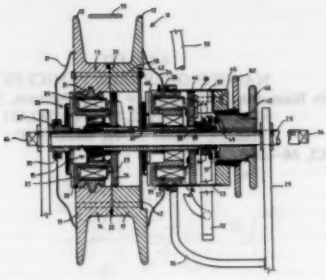
1. A device for the trapping of snakes and similar animals, comprising:
at least four areas of netting;
said netting areas being serially adjacently connected;
the first and last of said netting areas being adapted to be placed substantially flat on the ground;
other of said netting areas being substantially non-horizontal to the ground; and,
the interstices of said netting areas varying in size from area to area.

4,449,317

FISHING APPARATUS

Marcus T. Brodribb, Wharf St., Currie, King Island, Tasmania; Anthony G. Brodribb, Bunton Ave., Triabunna, Tasmania, and David H. Baillie, 2 Salacia Ave., Mermaid Waters, Queensland, all of Australia

Filed Dec. 31, 1981, Ser. No. 336,336
Claims priority, application Australia, Oct. 8, 1981, PF1111
Int. Cl.³ A01K *89/017, 89/02*
U.S. Cl. 43—15 12 Claims



1. Fishing apparatus including:
a rotatable driving shaft;
a fixed lay shaft supported concentrically about said driving shaft;
a reel assembly mounted rotatably about said driving shaft for supporting a fishing line;
a clutch assembly operable for selectively connecting said reel assembly to said driving shaft to reel in said line and including a driving clutch member rotatable with said driving shaft, a driven clutch member rotatable with said reel assembly, and electro-magnetic clutch actuating means supported on said lay shaft for coupling said clutch members;
a brake assembly within a housing for selectively connecting said reel assembly to said lay shaft to stop rotation of said reel assembly and including a fixed braking member supported on said lay shaft, a rotatable braking member rotatable with said reel assembly, and electro-magnetic brake actuating means supported on said lay shaft for coupling said braking members; and
a line monitoring means for monitoring the fishing line tension and for controlling said clutch and brake actuating means in response to changes in fishing line tension, said line monitoring means having a first control position at which said brake actuating means is actuated to couple said braking members to stop the reel assembly, and a second control position at which said clutch actuating means is actuated to couple said clutch members to connect said reel assembly to said driving shaft for rotation therewith.

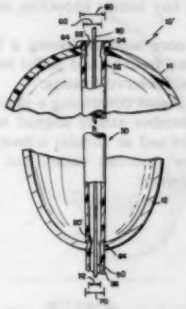
4,449,318

FISHING BOBBER

Garnett S. Lane, 301 Green Rd., Madison, Ind. 47250

Continuation-in-part of Ser. No. 157,336, Jun. 9, 1980, abandoned. This application Aug. 24, 1981, Ser. No. 295,639
Int. Cl.³ A01K *93/00*
U.S. Cl. 43—44.9 1 Claim

1. A fishing bobber, comprising a preformed plastic egg-shaped shell having a generally hollow semispherical-shaped top section and a generally hollow conical-shaped bottom section, a chemical weld connection providing a seal between the top and bottom sections, diametrically opposed apertures formed in the top and bottom sections of the shell, each having a predetermined cross-sectional dimension, the dimension of the aperture in the top section being larger than the dimension of the aperture in the bottom section, an elongated tapered resilient tube exhibiting substantially non-memory properties and engaging said apertures and extending longitudinally through the shell, the tube including a first end having a first cross-sectional dimension which is about 0.020 to 0.025 inch greater than the cross-sectional dimension of the aperture in the top section to form a compression seal between the top section and the tube, the tube further including a second end having a second cross-sectional dimension which is about 0.020 to 0.025 inch greater than the cross-sectional dimension of the aperture in the bottom section to form a compression seal between the bottom section and the tube, the first and having



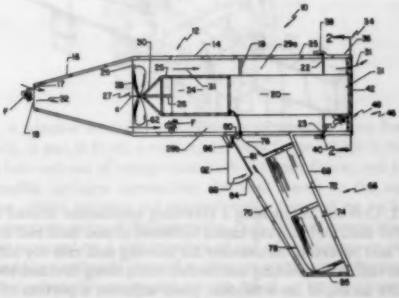
a greater cross-sectional dimension than the second end, so that when the tube is inserted into the shell, there is no deformation of the top shell aperture or the tube bottom until the final seating of the top of the tube with the top shell aperture and the bottom of the tube with the bottom shell aperture, the first end including a peripheral flange extending radially therefrom for engaging the top section of the shell, the second end of the tube including a line guide opening having a cross-sectional dimension which is slightly greater than the cross-sectional dimension of the line, the second end projecting beyond the periphery of the bottom section of the shell to provide a fulcrum for stabilizing the shell in an upright position on a liquid surface with minimum weight on the line beneath the surface.

4,449,319

FLY EXTERMINATOR

Gerry R. Garcia, 4180 Rosewood, Saginaw, Mich. 48603

Filed May 26, 1981, Ser. No. 267,051
Int. Cl.³ A01M *3/00*
U.S. Cl. 43—139 19 Claims



18. Hand-held insect exterminating apparatus comprising:
a hollow elongate housing including a forward terminal end provided with a forwardly disposed air inlet, said housing

further including a hollow cylindrical jacket terminating in a rearward end defining a rearwardly opening air outlet, and a passage between said inlet and outlet;

suction creating means disposed in said passage for drawing a stream of air in a downstream path of travel into said passage through said inlet and outwardly therefrom through said outlet;

perforate means, disposed on said housing in the path of said stream of air, for axially passing said stream of air but interrupting the passage of any insects entrained in said air stream;

a rearward hollow cylindrical reservoir casing detachably mounted on said rearward end of said jacket for receiving and storing any insects impacting said perforate means; and

a cylindrical core member having a forward portion received by and fixed to said jacket and a rear portion received by said reservoir casing;

said perforate means comprising a stationary central screen mounting member axially aligned with said cylindrical core member and an annular screen spanning said rearward hollow reservoir casing and said central screen mounting member.

4,449,320

Patent Not Issued For This Number

4,449,321

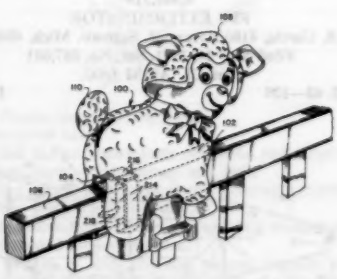
CRIB TOY

Walter S. Reiling, Livingston, N.J., assignor to Meritus Industries, Inc., Florham Park, N.J.

Filed Dec. 23, 1982, Ser. No. 452,813

Int. Cl.³ A63H *5/00*

U.S. Cl. 46—113 **18 Claims**



1. Crib toy comprising a reversing mechanism housed in an outer shell and moving means mounted in said shell and driven by said reversing mechanism for moving said crib toy along a crib rail, said reversing mechanism comprising first and second gears arranged on a support plate adjacent a portion of said moving means, said support plate being pivotally mounted within said shell between a first and second position, rotating means for rotating said first and second gears, and pivoting means for pivoting said support plate to alternately engage said first and second gears with said moving means whereby said crib toy is driven along said crib rail in a forward and then reverse direction, said pivoting means comprising a cam and cam follower, said cam being rotated by said rotating means and said cam follower having a member engaging a portion of said support plate.

4,449,322

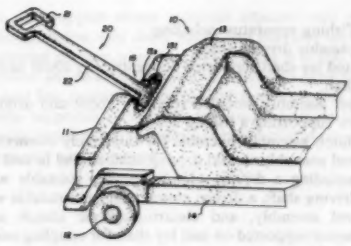
HANDLE OPERABLE VEHICLES

Martin Blumenthal, 99 Longview Ave., Chatham, N.J. 07928

Filed May 27, 1982, Ser. No. 382,631

Int. Cl.³ A63H *11/10*; B62B *3/00*

U.S. Cl. 46—202 **6 Claims**



1. A vehicle comprising

a housing;

an aperture in said housing;

an accessory which is receivable in siad aperture and engageable in said housing for use in the operation of said vehicle and is also releasable thereform for auxiliary uses in connection therewith;

said accessory comprising a handle that can be used in manuevering said vehicle and being provided with a shovel blade at the portion thereof which is engageable in said aperture; said aperture forming a "T"-shaped slot with the "T" portion thereof receiving the shovel blade and the stem of the "T" portion guiding said handle and the housing includes an internal semicircular track to permit the rotation of said blade.

4,449,323

ADJUSTABLE SPINNING TOY VEHICLE

David R. Fisher, Rancho Palos Verdes, Calif., assignor to Zee Toys, Inc., Long Beach, Calif.

Filed May 20, 1982, Ser. No. 380,218

Int. Cl.³ A63H *17/26, 17/38*

U.S. Cl. 46—211 **9 Claims**

1. A toy vehicle comprising:

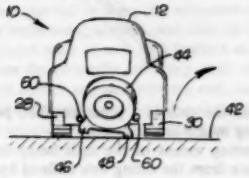
a body;

at least one front wheel positioned toward a forward end of said body;

a pair of spaced-apart rear wheels positioned toward a rearward end of said body;

motor means for driving said rear wheels to propel the vehicle;

a counterbalance weight positioned toward said rearward end of said body, rearward of said rear wheels, to provided a downwardly directed counterbalance force which, in conjunction with the torque on said rear wheels produced by said motor means, causes said at least one



front wheel to raise off the ground as the vehicle moves forward; and

a support member having attached thereto a pair of spaced-apart skids and being adjustable to selectively position one or the other of said skids to engage the ground at a point located adjacent to and rearward of either one or the other of said rear wheels as the vehicle moves forward with said at least one front wheel off the ground, such that the vehicle may be caused to spin substantially in circles, with the direction of rotation of the spin depending upon the position preselected for said support member.

4,449,324

WIND VANE HANGING PLANT CONTAINER

Adam R. Ostarly, Rte. 1, Box 651F, Covington, La. 70433

Filed Aug. 30, 1982, Ser. No. 412,606
Int. Cl.³ A01G *9/02*
U.S. Cl. 47—67 **19 Claims**

1. A hanging plant container, comprising:

a. container means for holding soil and a plant, wherein said container means comprises bottom and side walls defining an open cavity;

b. at least one support arm having an elongated bottom base portion rigidly attached to said bottom wall of said container means near the center of gravity thereof to prevent tilting of said container means; a medial portion integrally connected to said bottom base portion and rigidly attached to said side wall of said container means and extending upwardly alongside the side wall of said container means beyond the top thereof, said medial portion being attached to said sidewall adjacent its upper part; a wind vane-like top portion, integrally connected to said medial portion and extending at approximately 45° angle from the top of said medial portion inwardly and upwardly in relation to said open cavity to a point approximately above its vertical center axis, said top portion being relatively wide in its vertical plane and relatively narrow in its horizontal plane to act as a wind vane and substantially inhibit rotational movement of said container means beyond a maximum rotational arc of 90°;

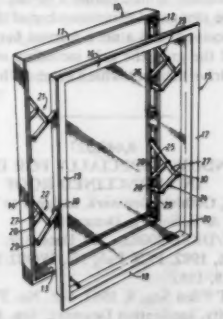
c. adjustable hanging means associated with said support arm for selectively suspending said container means from any overhead structure.

4,449,325

ADJUSTABLE WINDOW ASSEMBLY

David E. Rawlings, Cheltenham, England, assignor to Consort Aluminium Limited, Tewkesbury, England

Filed Jun. 29, 1982, Ser. No. 393,624
Int. Cl.³ E05D *15/52*
U.S. Cl. 49—192 **3 Claims**



1. A window assembly comprising a rectangular open frame which, in use, is fixed; a rectangular vent frame which is movable into and out of engagement with the open frame; and four extensible linkages connecting the vent frame to the open frame, which linkages are symmetrically disposed on each of two opposite sides of the assembly, each linkage comprising a track mounted on a side member of one of the frames so as to extend longitudinally thereof, a slider movable along the track, a strut pivotally connected to the track, a brace pivotally connected between the slider and the strut, a link pivotally connected to the slider, and a bar pivotally connected between the link and the strut and pivotally connected at its end to a side member of the other of the frames, whereby the vent may

be selectively adjusted angularly with respect to the frame by differential extension of at least certain of the linkages.

4,449,326

GLASS PANE HOLDER FOR WINDOW REGULATOR

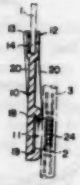
Syunichi Hori, 8-24-301, Shimomeguro 6-chome, Meguro-ku, Tokyo, and Isao Kurihashi, 67-3, Nakaechi, Atsugi-shi, Kanagawa, both of Japan

Filed May 4, 1982, Ser. No. 374,647

Claims priority, application Japan, Jun. 6, 1981, 56-87345; Jun. 6, 1981, 56-87346

Int. Cl.³ E05F *11/38*

U.S. Cl. 49—375 6 Claims



1. A glass pane holder for coupling a glass pane to a window regulator including a flexible elongated drive member which slidably extends through a guide track having a lengthwise extending slotted opening; comprising

a bracket molded from a hard resin and having a pair of opposite walls which define a transversely extending elongate slot therebetween which receives an edge portion of the glass pane;

and a connection member detachably mounted on the bracket and engageable with the flexible elongated drive member through the slotted opening formed in the guide track;

the connection member being formed by a single foldable material and including a pair of wings which lie in a common plane, a grip located intermediate the wings and formed, by a press operation, into substantially Ω-configuration in section which define a closed groove in which the flexible elongated drive member of the window regulator is received, and a neck formed between the pair of wings and the grip, the grip including means engageable with the drive member which extends through the closed groove.

4,449,327

TILTING WINDOW, ESPECIALLY FOR INSTALLATION IN AN INCLINED ROOF

Elgard Nielsen, Ostbirk, Denmark, assignor to V. Kann Rasmussen Holding A/S, Soborg, Denmark

PCT No. PCT/DK81/00082, 371 Date Apr. 26, 1982, 102(e) Date Apr. 26, 1982, PCT Pub. No. WO82/00842, PCT Pub. Date Mar. 18, 1982

PCT Filed Sep. 8, 1981, Ser. No. 375,275

Claims priority, application Denmark, Sep. 10, 1980, 3850/80

Int. Cl.³ E05D *15/00*

U.S. Cl. 49—390 5 Claims

1. A tilting window arrangement, particularly intended for installation in an inclined roof structure, comprising

a main frame including a top member, two spaced lateral members and a bottom member,

an intermediate frame including two lateral members which in the closed position of the window extend at least along the upper half of said main frame lateral members,

hinge means between the top portions of said main and intermediate frames and defining an axis that is parallel to said main frame top member,

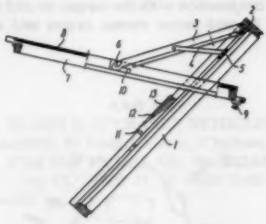
means operative to urge said intermediate frame away from its closed position by swinging about said hinge means,

a pane supporting sash,

pivot means arranged adjacent the horizontal center line of said sash and tiltingly connecting said sash to said intermediate frame lateral members,

manually releasable locking means operative between the upper portions of said sash and said intermediate frame, and

cooperative arresting means on said sash and said main frame



to hold the sash in a predetermined position when said locking means are engaged,

the arresting means of the sash being located at a slight distance from the tilting axis defined by said pivot means to be automatically caught by and released from the associated arresting means of said main frame upon tilting of said sash in its closing and opening direction, respectively, in relation to said intermediate frame in the almost closed position thereof.

4,449,328

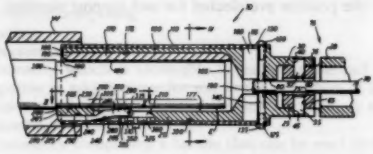
INSIDE, OUTSIDE HONING TOOL

Robert H. Gillette; Terrence N. Brammall; Kent Shelton, and Chris Cramer, all of Angola, Ind., assignors to Brammall, Inc., Angola, Ind.

Division of Ser. No. 138,700, Apr. 9, 1980, Pat. No. 4,323,646. This application Feb. 5, 1982, Ser. No. 346,109

Int. Cl.³ B24B *5/00*

U.S. Cl. 51—73 R 1 Claim



1. In a honing tool suitable to hone a cylindrical surface substantially to a terminating surface, including an elongated cylindrical hollow tool body with a plurality of tool holders circumferentially mounted on a selected end region thereof, with each tool holder supporting a honing stone, an improvement wherein: said tool body is formed with a cylindrical wall having a selected essentially constant thickness, and includes a plurality of elongated slots formed in said cylindrical wall in said selected end region of said tool body, said slots are circumferentially spaced around said end region, each said slot has two parallel, spaced apart axially oriented side surfaces formed in said cylindrical wall; each said tool holder is positioned essentially completely within a corresponding slot in said cylindrical wall between said spaced apart axially oriented surfaces; means for pivotally attaching each tool holder to said tool body, each said means for attaching is positioned to extend between said spaced apart axially oriented surfaces within a corresponding slot and is attached to at least one selected region within said cylindrical wall, each said means is adapted to pivotally attach an end of a said respective tool holder positioned within said slot to said cylindrical wall; means for

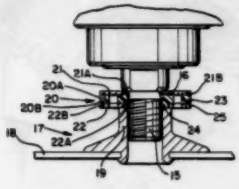
expansion, said means for expansion substantially surrounds the tool body, is axially movable, and is operative to engage a region located within a corresponding slot on each said tool holder and pivot each member of said plurality of tool holders inwardly toward the surface being honed, wherein the hollow cylindrical tool body is adapted to receive therein a workpiece with a cylindrical surface to be honed and wherein said means for expansion includes a hollow cylindrical outer portion with a plurality of surfaces offset with respect to an axis of said cylindrical outer portion, and wherein said means for expansion and each said means for pivotally attaching cooperate to pivot each tool holder inwardly toward the surface of the workpiece to be honed in response to axial movement of said means for expansion in a selected direction along said cylindrical tool body, and wherein each said pivotally mounted tool holder supports the associated honing stone with a selected end region of the stone exposed to hone the reference cylindrical surface adjacent a terminating surface, and wherein said means for expansion engages each of said tool holders at a location between said means for pivotally attaching each of said tool holders to said tool holder and said selected end, and a plurality of elongated plastic members mounted in slots in said cylindrical wall in said selected end region of said tool body so as to engage said cylindrical surface.

4,449,329

COMPOSITE WASHER ASSEMBLY

William D. Sauerwein, Westminster, Md.; Daniel H. Sides, New Freedom, Pa.; Steven A. Weber, Glyndon, and James R. Horney, Cockeysville, both of Md., assignors to Black & Decker Inc., Newark, Del.

Filed Aug. 6, 1982, Ser. No. 406,086
Int. Cl.³ B24B *41/04*
U.S. Cl. 51—168 **15 Claims**



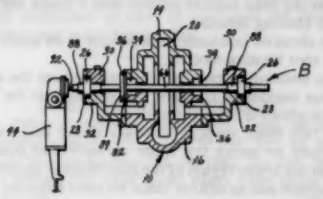
1. For use with a portable grinder or other power tool of the type having a tool element subassembly and further having a spindle provided with an annular shoulder, an annular composite washer assembly received over the spindle and disposed axially between the shoulder and the tool element subassembly, said washer assembly comprising a first annular washer, a second annular washer spaced axially from the first washer, substantially parallel thereto and aligned coaxially therewith, the washers having respective inner and outer diameters, and an annular resilient body between the first and second washers and integrally molded thereto, the body having a first integral annular band extending radially inwardly of the washers and joined to the respective inner diameters thereof, and the body further having a second integral annular band extending radially outwardly of the washers and joined to the respective outer diameters thereof, whereby the washer assembly forms a soft mount for the tool element subassembly.

4,449,330

RESURFACING PROCESS AND TOOL FOR INSTALLING CATRIDGE-TYPE

Cornelius J. McCarthy, 1412 Widefields, St. Louis, Mo. 63138, and George E. Aplin, 888 Stacey La., Fenton, Mo. 63026

Filed Apr. 14, 1982, Ser. No. 368,123
Int. Cl.³ B24B *15/00*
U.S. Cl. 51—241 S **21 Claims**



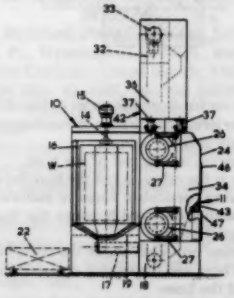
1. A tool for resurfacing the surface of a pump casing where a shaft, that is supported on bearings, emerges from the casing, said tool comprising: an arbor adapted to fit into the pump casing in lieu of the shaft; a grinding wheel carried by the arbor and configured to locate opposite the surface of the casing that is to be resurfaced; means connected to the arbor for rotating the arbor, and thrust applying means capable of being mounted upon the pump for exerting an axially directed force on the arbor as it rotates, with the force being oriented such that the grinding wheel is urged against the casing for resurfacing the casing in the region where the shaft normally emerges from the casing, the thrust applying means including a mount that is capable of being attached securely to the pump, a lever that pivots on the mount, and means for coupling the lever and the arbor such that a force exerted on the lever is transmitted into an axially directed force on the arbor.

4,449,331

SHOT BLASTING MACHINERY

William R. MacMillan, Sale, England, assignor to Tilghman Wheelabrator Limited, Altrincham, England

Filed Mar. 4, 1982, Ser. No. 354,693
Claims priority, application United Kingdom, Mar. 17, 1981, 8108333
Int. Cl.³ B24C *3/04*
U.S. Cl. 51—425 **13 Claims**



1. A shot blasting machine comprising:
(1) a blast cabinet module into which a workpiece to be shot blasted can be conveyed; and
(2) a shot blasting module directly connected to the blast cabinet module in communicating relationship therewith, the shot blasting module including:
(A) a casing open to the interior of the blast cabinet module,

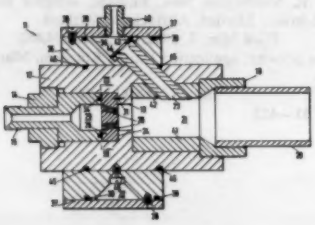
(B) a swing-out door pivoted on the casing and openable to permit access to the interior thereof,
(C) an abrasive throwing wheel assembly mounted on the internal surface of the swing-out door and including a rotatable throwing wheel for impelling abrasive into the blast cabinet module,
(D) a motor drivingly coupled to the throwing wheel and mounted on the external surface of the swing-out door,
(E) means for delivering spent abrasive and contaminants from the blast cabinet module into a lower region of the shot blasting module,
(F) an abrasive/contaminant separator in an upper region of the shot blasting module,
(G) an abrasive storage hopper intermediate the upper and lower regions of the shot blasting module for receiving clean abrasive from the separator,
(H) a two stage vertical conveyor means adapted simultaneously to direct the spent abrasive and contaminants from the lower region of the shot blasting module into the separator and to deliver clean abrasive from the separator into the storage hopper,
(I) a delivery pipe extending from an outlet of the storage hopper to the throwing wheel assembly,
(J) a valve at the storage hopper outlet for controlling flow of clean abrasive from the storage hopper into the delivery pipe, and
(K) a feed spout forming part of the abrasive throwing wheel assembly and aligned with the outlet of the delivery pipe when the swing-out door is closed to receive clean abrasive from the delivery pipe and direct it into the throwing wheel.

4,449,332

DISPENSER FOR A JET OF LIQUID BEARING PARTICULATE ABRASIVE MATERIAL

Norman J. Griffiths, 35 Weston Park Ave., Shelton Lock, Derby, England

Continuation of Ser. No. 62,570, Jul. 31, 1979, abandoned. This application May 13, 1981, Ser. No. 263,324
Int. Cl.³ B24C *5/04*
U.S. Cl. 51—439 **3 Claims**



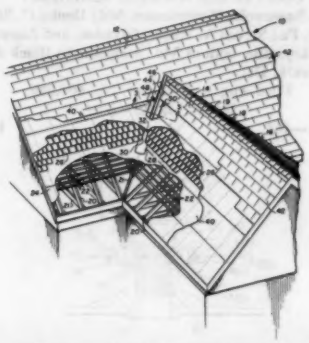
1. In a dispenser for dispensing a jet of liquid bearing particulate abrasive material, comprising in combination:
a hollow body defining a bore;
liquid inlet means at one end of the bore;
outlet means at the other end of the bore for discharging the liquid bearing particulate abrasive material;
a mixing chamber disposed between the liquid inlet means and the outlet means;
abutment means provided within the bore, between said one end of the bore and the mixing chamber, so as to face said one end of the bore;
a nozzle holder seated against the abutment means;
a plurality of inlet nozzles mounted in the nozzle holder for directing a flow of liquid through the mixing chamber, each said inlet nozzle being dimensioned and arranged so that, in the use of the dispenser, the radial cross-section of the flow of liquid through the mixing chamber is smaller than the cross-section of the mixing chamber;
each said inlet nozzle having a discharge end or tip lying within the mixing chamber at a first axial location relative to the direction of the flow of liquid, and the plurality of inlet nozzles being arranged so as to direct liquid along intersecting axes which are angularly inclined, in the same sense, to radial planes containing the central axis through the mixing chamber;
locking means for preventing rotation of the nozzle holder;
a supply chamber for the particulate material;
passage means for transferring the particulate material from the supply chamber to the mixing chamber, and comprising a plurality of passages which respectively extend along axes convergent with the direction of the flow of the liquid;
entry ports in the wall of the mixing chamber by which particulate material leaves the passages and enters the mixing chamber, the entry ports lying at a second axial location relative to the direction of the flow of liquid and axially downstream relative to said first axial location; and
said mixing chamber having a portion of axial length as defined between said first and second axial locations wherein the flow of liquid directed by each said inlet nozzle travels within the mixing chamber but wherein no particulate material flows after entering the mixing chamber by way of the entry ports due to said entry ports being at the downstream axial end of said portion.

4,449,333

VALLEY STRIP FOR ROOF STRUCTURE

David G. Stratton, 1301 16th St., Plano, Tex. 75074

Filed Jun. 18, 1982, Ser. No. 389,761
Int. Cl.³ E04D *1/36*
U.S. Cl. 52—13 **6 Claims**



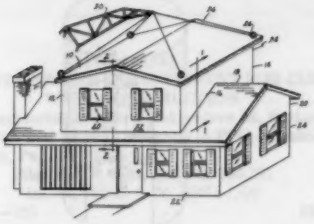
1. In a roof structure including at least two sloping roof surfaces intersecting at an angle to form a valley, said roof structure including a first roof covering on said roof surfaces, each of said first roof coverings being formed with adjacent spaced apart parallel edges, a second roof covering overlying said first roof covering and including a valley strip being defined by an elongated sheet member having a channel portion formed by a flat bottom wall and two spaced apart sidewalls extending substantially vertically upward from said bottom wall, opposed flange portions of said valley strip extending from said sidewalls and underlying said second roof covering on said roof surfaces, respectively, said valley strip extending to a ridge formed by the intersection of at least one of said roof surfaces with an opposed roof surface, said bottom wall of said valley strip extending over said ridge and at least partially along said opposed roof surface, and the depth of said channel portion being reduced at said ridge by said sidewalls being folded toward each other to overlie said bottom wall to flatten said valley strip at said ridge.

4,449,334

DORMER STRUCTURE AND METHOD

Sheldon Shacket, Southfield, and Robert Helfman, Franklin, both of Mich., assignors to Trus-Us, Inc., Royal Oak, Mich.

Filed Jan. 26, 1983, Ser. No. 461,024
Int. Cl.[3] E04B 7/02
U.S. Cl. 52—79.3 7 Claims



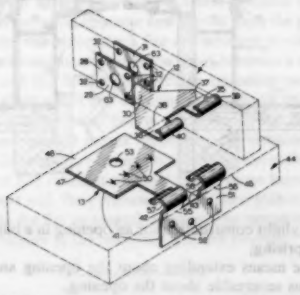
1. In combination an original building structure having at least two parallel spaced apart bearing walls and roof structure and a later constructed dormer room addition to the original building structure positioned in the roof structure of the original building structure and extending completely between and bearing on only the spaced apart bearing walls of the original building structure wherein the later constructed dormer room addition includes at least two spaced apart walls extending between the bearing walls of the original building structure and wherein the spaced apart walls of the dormer room addition form beams between the bearing walls of the original building structure which beams carry the full weight of the dormer room addition and transfer the weight of the dormer room addition to the bearing walls of the original building structure.

4,449,335

ROOF FRAMING SYSTEM

Patrick Fahey, 2609 W. 52nd St., Minneapolis, Minn. 55410

Filed Jun. 3, 1982, Ser. No. 384,745
Int. Cl.[3] E04B 7/02, 1/38
U.S. Cl. 52—90 2 Claims



1. A roof framing system for a roof having a plurality of rafters extending between top sill plates, each rafter having upper and lower ends, comprising the combination of an apex bracket,

the apex bracket comprising a first section for grasping the upper end of a first rafter, a second section for grasping the upper end of a second rafter, and an intermediate section operably coupling said first and second sections for setting the pitch between said first and second rafters, and two bracket assemblies, each bracket assembly comprising a rafter bracket and a sill plate bracket,

the rafter bracket comprising a rafter grasping section and two arms adjustably extending from said rafter grasping section, said arms being separated by a distance sufficient to allow one of said rafters to be disposed therebetween, and each arm including an outermost section comprising a lip formed by bending said arm back upon itself, and

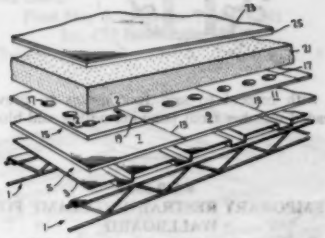
the sill plate bracket comprising a mounting section for grasping one of said top sill plates, two arms adjustably extending from said mounting section, said arms separated by a distance sufficient to allow one of said rafters to be disposed therebetween, and a rafter bracket receiving section connected to each of said arms for detachably receiving said rafter bracket lips.

4,449,336

FIRE BARRIER RESERVOIR

Thomas L. Kelly, 21 Sands St., Waterbury, Conn. 06710

Continuation-in-part of Ser. No. 160,948, Jun. 19, 1980, abandoned. This application Jul. 19, 1982, Ser. No. 399,213
Int. Cl.[3] E04B 1/00; E04C 2/00; E04D 5/00; E04B 1/76
U.S. Cl. 52—105 20 Claims



1. A roof structure including, in combination, a supporting means, a fireproof member mounted on said supporting means and comprising a plurality of sections with their adjacent edges in abutting relationship providing seams therebetween, a reservoir board mounted on and secured to said sections of the fireproof member, said reservoir board being provided with an aperture therein extending at least partially through the reservoir board, insulation mounted on said reservoir board, the insulation being meltable into a molten flowable mass when subjected to heat, and means covering the top surface of said insulation.

4,449,337

ADJUSTABLE BASE FOR OFFICE LANDSCAPING SYSTEM

Larry P. Gzym, Rockford; Lloyd G. Ritzema, Lowell, and David K. Haadsma, Jr., Wyoming, all of Mich., assignors to Stow Davis Furniture Company, Grand Rapids, Mich.

Filed Mar. 15, 1982, Ser. No. 358,091
Int. Cl.[3] E04G 21/00
U.S. Cl. 52—126.4 23 Claims

1. A wall panel base construction comprising:

means for supporting a wall panel;

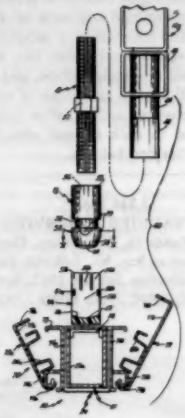
foot means for supporting said base construction on a surface;

a block member defining a threaded bore;

means for supporting said block member within said foot means for tilting and shifting movement with respect to said foot means; and

an upwardly extending threaded member having a lower threaded portion adjustably secured within said threaded bore within said block member, said threaded member having an upper portion supporting said wall panel support means, said threaded member thereby operatively supporting said panel support means on said foot means, whereby the height of said panel supporting means above said foot means can be adjusted by rotating said threaded

member, and whereby said block member tilts and shifts to accommodate tilting and shifting of said threaded member with respect to said foot means to prevent said threaded member from jamming within said block member.

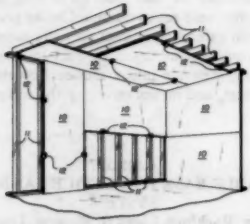


4,449,338

TEMPORARY RESTRAINING CLAMP FOR WALLBOARD

James E. Reicherts, Cary, Ill., assignor to United States Gypsum Company, Chicago, Ill.

Filed Jun. 28, 1982, Ser. No. 392,444
Int. Cl.³ E02D *35/00*
U.S. Cl. 52—127.8 **6 Claims**



1. A clamp adapted for the temporary support of a building panel during installation, said clamp comprising an L-shaped body, one leg being adapted for contact with said panel, and a screw projecting from the other leg of the L through and beyond the panel contacting leg and perpendicular to said panel contacting leg.

4,449,339

SIDE-WALL DISCHARGE SYSTEM

Charles E. Bubb, Tulsa, and Fred E. Mauch, Sapulpa, both of Okla., assignors to Parkersburg Tank, Division of Maloney Crawford Corporation, Tulsa, Okla.

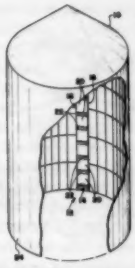
Filed Oct. 5, 1981, Ser. No. 308,619
Int. Cl.³ E04H *7/00*
U.S. Cl. 52—195 **3 Claims**

1. In a storage tank for particulate material having exterior sidewalls resting on a foundation and attached to interior vertical structural members that directly support the roof, the specific improvement comprising:

(a) at least two of said support members being adjacent and essentially parallel from the foundation to the top of said storage tank sidewall;

(b) a sidewall discharge means located between said adjacent support members through which stored particulate material is withdrawn; and

(c) a plurality of essentially vertical flat surfaces periodically mounted along the inside of said pair of adjacent vertical support members leaving openings between successive surfaces wherein said support members, sidewall and vertical flat surfaces form an interior chute with a plurality of openings in communication with said discharge means that allows selected flow of said stored particulate material during discharge, from successive top strata.

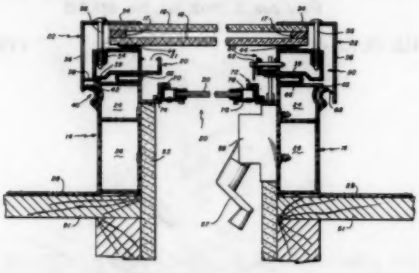


4,449,340

VENTILATING SKYLIGHT

Arthur P. Jentoft, Kennebunkport, and Paul A. Couture, Emery Mills, both of Me., assignors to Wasco Products, Inc., Sanford, Me.

Filed Jan. 22, 1982, Ser. No. 341,773
Int. Cl.³ E04B *7/18*
U.S. Cl. 52—200 **14 Claims**



1. A skylight construction for an opening in a building or the like comprising;

a frame means extending about the opening and including means secureable about the opening,

translucent or transparent means covering the opening and extending at edges to overlie the frame means,

means for retaining the covering means on the frame means,

said frame means comprising a base frame and a support frame overlying the base frame,

said frame means having at least said base frame comprised of a rigid plastic core having high temperature resistant properties, and a plastic capping material extruded over the external exposed surface of the core to protect the core from weathering,

said base frame having at least one flexible gasket integrally formed with said plastic core,

said integral flexible gasket comprising a gasket extending

from and integral with a top horizontally-disposed wall of the base frame and disposed sandwiched between the base frame and overlying support frame,

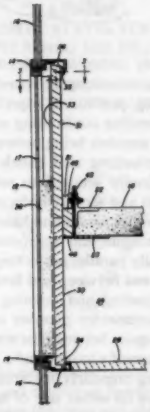
said plastic capping material being substantially thinner than the thickness of the base frame, being less rigid than the plastic core and terminating at the base of the flexible gasket so that the gasket is absent a covering of the capping material so that the gasket maintains its flexibility.

4,449,341

FIRE CONTAINMENT ARRANGEMENT FOR CURTAIN WALL CONSTRUCTION

Philip C. Taglianetti, Brooklyn, and Andrew M. Burkard, Port Washington, both of N.Y., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Apr. 1, 1982, Ser. No. 364,285
Int. Cl.³ E04B *1/74*; E04H *1/04*
U.S. Cl. 52—235 **11 Claims**



1. In a multi-level building having an elevated floor slab structure and an exterior curtain wall that includes spandrel glazing panels mounted opposite and spaced from the pheriphery of the floor slab structure; a fire containment arrangement comprising: a fire resistant insulation sheet between a spandrel glazing unit and the floor slab structure extending parallel to the spandrel glazing unit and covering substantially the area of the spandrel glazing panel below the level of the floor slab structure, heat resistant means supporting the insulation sheet on the floor slab structure independently from the curtain wall, and a body of fire resistant material filling space between the insulation sheet and the perimeter of the floor slab structure, whereby paths for fire propagation around the periphery of the floor slab structure in the spandrel area are blocked.

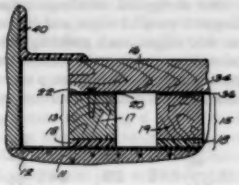
4,449,342

FLOORING SYSTEM

Carl W. Abendroth, 210 Crystal Ave., Crystal Falls, Mich. 49920

Filed Jun. 10, 1982, Ser. No. 387,184
Int. Cl.³ E02D *27/00*
U.S. Cl. 52—393 **11 Claims**

1. A flooring system comprising a foundation, support members on said foundation, floating members on said foundation and located between and generally parallel to said support members, floorboards superposed on said support members and said floating members, strips of resilient material between said floating members and said floorboards, and means for fastening said floorboards to said support members so that said



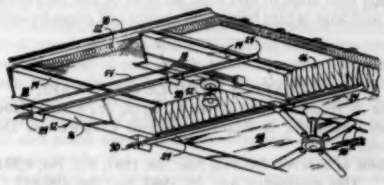
strips of resilient material are in compression between said floorboards and said floating members.

4,449,343

INSULATION SUSPENSION SYSTEM

Dennis N. Henningsen, Highway 18 East, P.O. Box 310, Mason City, Iowa 50401

Filed May 3, 1982, Ser. No. 374,341
Int. Cl.³ E04B *1/74, 5/55*
U.S. Cl. 52—404 **6 Claims**



1. An insulation suspension system for a roof having a plurality of elongated purlins on the under surface of said roof, said purlins having longitudinal axes extending in parallel spaced relation to one another, each of said purlins having in cross-section an upstanding web and a horizontal flange connected to the bottom edge of said web, said horizontal flange having a downwardly presented surface, at least one electrical appliance connected to said downwardly presented surface and protruding downwardly therefrom; said system comprising:

a plurality of elongated parallel support members extending transversely to the longitudinal axes of said purlins and spanning the space between said spaced apart purlins,

clip means operatively attached to said purlins and retentively engaging said support members at opposite ends thereof so as to hold said support members in close proximity to said downwardly presented surfaces of said purlins,

a sheet of insulation material filling the space between said webs of said spaced apart purlins, said sheet having a downwardly presented surface which is positioned approximately in the same horizontal plane as said horizontal flange and which is fitted above said horizontal flange so as to leave said downwardly presented surface and said downwardly protruding appliance exposed from below;

said support members underlying and providing support to said sheet of insulation between said purlins.

4,449,344

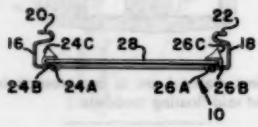
CEILING PANEL AND LENS

James Dodich, New Milford, N.J., assignor to Levolor Lorentzen, Inc., Lyndhurst, N.J.

Filed Jan. 4, 1982, Ser. No. 336,572
Int. Cl.³ E04B *5/57*
U.S. Cl. 52—475 **1 Claim**

1. For use in a suspended ceiling: an elongated ceiling panel having elongated flanges for suspending said ceiling panel, and

an elongated bottom integral with said flanges, an elongated opening in said bottom extending over a substantial portion of said bottom and being defined by elongated parallel edges in said bottom; two elongated moldings respectively located along said elongated parallel edges and having essentially the same length as said edges, each molding being essentially S-shaped in cross section and in cross section having a relatively narrow first portion below said bottom, a second portion parallel to and wider than the said first portion and located above



said bottom, said second portion being integral with said first portion and connected thereto by a portion placed around the respective edge, and a third portion spaced outwardly away from said opening and located above said bottom; and an elongated lens wider than said opening and slidably received in said panel between said third portions of said two moldings, said lens being supported by said second portions of said two moldings and being held onto said panel by spaced downwardly bent areas of said third portions of said two moldings, said moldings in turn being held against said edges by said lens.

4,449,345

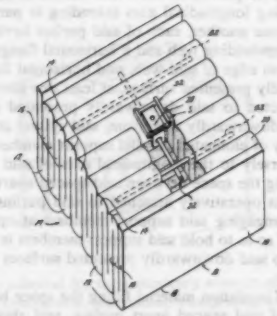
INSULATION MODULE HARDWARE

Mack A. Hounsel, and Carlisle O. Byrd, Jr., both of Houston, Tex., assignors to Manville Service Corporation, Denver, Colo.

Division of Ser. No. 245,946, Mar. 20, 1981, Pat. No. 4,381,634. This application Apr. 29, 1983, Ser. No. 490,012

Int. Cl.³ E04B *1/80*

U.S. Cl. 52—506 **10 Claims**



1. Attachment hardware adapted for mounting an insulation module on one surface of a furnace, said module having a hot face and a cold face which between them define a module thickness, a pair of side faces which between them define a module length, and a top face and a bottom face which between them define a module width, said hardware comprising:

suspension arm means extending along some portion of the length and width of the cold face of the module, said suspension arm means having a plurality of suspension tabs extending from the cold face toward the hot face for some predetermined distance into the thickness of said module intermediate said two side faces;

at least one set of aligned apertures in said suspension tabs;

support bar means extending longitudinally through at least some portion of the length of the module, said support bar means being received in said at least one set of aligned apertures in the plurality of suspension tabs and penetrating said module, said portion of the length of the module being less than the full length whereby said suspension tabs and said support bar means are fully contained internally of said module; and means for securing said suspension arm means to said furnace wall.

4,449,346

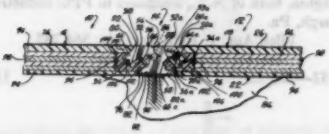
PANEL ASSEMBLY

J. Gerard Tremblay, 8361 Place Fonteneau, Montreal, Quebec, Canada (H1K 4S2)

Filed Nov. 12, 1980, Ser. No. 206,150

Int. Cl.³ E04B *1/38*; E04C *1/40*

U.S. Cl. 52—509 **15 Claims**



1. A panel assembly including at least two panels and a connector member for mounting the panels to a support surface, said panels being positioned edge-to-edge in coplanar relationship with respective confronting edges thereof spaced apart, said connector member being between said confronting panel edges and interlocking said panels together by being compressively and fixedly secured to said support surface; each panel having first and second surfaces lying respectively in first and second parallel planes and having on its respective confronting edge a tongue and a groove, said tongue and groove having generally parallel projecting surfaces extending along said panel edge and between said first and second planes, and respectively projecting and opening angularly towards said first plane; said connector member comprising an elongated body filling the space between the confronting edges and having on each side thereof a tongue and a groove respectively projecting and opening angularly towards said second plane, said tongue and groove on either side of said connector member being complementary to and lockingly engaging with the respective groove and tongue on the adjacent confronting edges of said panels, said connector member being offset with respect to the second plane of said panels for forming a gap above the support surface and cooperating with said panels to urge said panels towards one another in tight locking engagement as a result of a compressive force being exerted on said connector member in a direction towards said support surface when said connector member is compressingly secured to said support surface.

4,449,347

SOLAR COLLECTOR BUILDING TRUSS

Floyd H. Rooney, 3124 Bunker Lake Rd., Anoka, Minn. 55303

Division of Ser. No. 907,788, May 17, 1978, Pat. No. 4,237,869. This application Nov. 17, 1980, Ser. No. 207,299

Int. Cl.³ C04B *7/02*

U.S. Cl. 52—639 **8 Claims**

1. A solar heat collector building truss, comprising:

(a) a base beam;

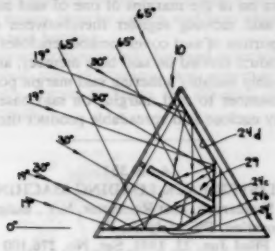
(b) a sunward beam extending upward from and over the base beam;

(c) a rear beam extending downward from an apex between said rear beam and the sunward beam;

(d) an upright central beam connected to and extending downward from the rear beam toward the base beam, said upright central beam being substantially perpendicular to the base beam and truncating a projected apex between the rear and base beams; and

(e) an inclined central beam spaced rearward of said sun-

ward beam between the upright central beam and the base beam said central beams forming between themselves an



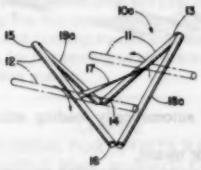
obtuse angle with the concave surfaces of the obtuse angle facing the sunward beam.

4,449,348

COMPOSITE STATIC STRUCTURE

James R. Jacobs, 2210 Murray Hill Rd., (#3), Cleveland, Ohio 44106

Filed Oct. 16, 1981, Ser. No. 312,289
Int. Cl.³ E04H *12/00*
U.S. Cl. 52—648 **10 Claims**



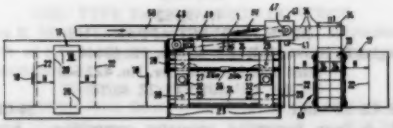
1. A static structure component comprising at least two rigid struts spaced along and extending perpendicular to a common axis, and lying in planes that intersect along said axis, a torsion member extending along said axis and connecting said struts, said torsion member being stressed in torsion, and means connecting said struts to one another at locations equally spaced from said axis and approximately at the ends thereof, in a manner to resist the torsional force of said torsion member and to retain said component in a static condition.

4,449,349

PACKING MACHINE WITH ADJUSTABLE MEANS FOR WEAKENING SELECTED PORTIONS OF CARDBOARD BLANKS OR THE LIKE

Oskar Roth, Zufikon, Switzerland, assignor to Involvo AG, Bünzen, Switzerland

Filed Nov. 23, 1981, Ser. No. 324,134
Claims priority, application Switzerland, Dec. 3, 1980, 8922/80
Int. Cl.³ B65B *59/02*
U.S. Cl. 53—66 **10 Claims**



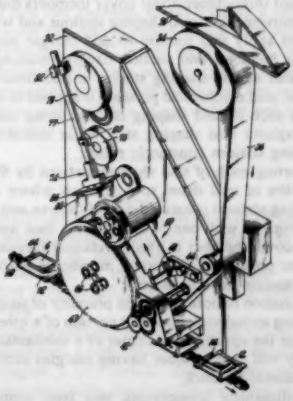
1. In a packing machine wherein commodities are draped into blanks having weakened portions constituting fold lines for conversion of such blanks into envelopes for the respective commodities, the combination of means for transporting a succession of blanks in a predetermined direction along a predetermined path; a packing station adjacent to a first portion of said path; means for feeding commodities of varying dimensions to said first portion of said path; a blank treating unit adjacent to a second portion of said path ahead of said first portion, as considered in said direction, said unit comprising blank weakening means including a pair of tools, means for moving said tools at least once toward and away from said path into and from engagement with successive balnks on advancement of such blanks into said second portion of said path, support means for said tools, said tools being movable with reference to said support means between a plurality of different positions relative to said second portion of said path so that the tools can engage and weaken different portions of a blank in each of said different positions thereof, means for moving said tools between said different positions including reversible prime mover means and means for moving said tools nearer to and further away from each other in response to actuation of said prime mover means, and first and second guide means on said support means, one for each of said tools, said tools being movable in the respective guide means toward and away from the blanks in said second portion of said path; means for monitoring the dimensions of commodities which are about to be draped into blanks in said first portion of said path, including means for generating signals which denote the height of commodities; means for actuating said prime mover means in response to said signals to that the selected distance between said tools is a function of the height of monitored commodities; and means for moving said monitoring means between a plurality of different positions in response to actuation of said prime mover means so that each position of said tools corresponds to a different position of said monitoring means, including a mobile carrier for said monitoring means, a feed screw meshing with said carrier and means for transmitting torque from said prime mover means to said feed screw.

4,449,350

METHOD AND APPARATUS FOR MAKING SEALED PACKAGES FOR SPREADABLE PRODUCTS

Redmond Sanford, 1385 York Ave., New York, N.Y. 10021

Continuation of Ser. No. 180,062, Aug. 29, 1980, abandoned, which is a continuation-in-part of Ser. No. 80,141, Sep. 28, 1979, abandoned. This application Sep. 9, 1982, Ser. No. 416,400
Int. Cl.³ B65B *47/06, 61/18*
U.S. Cl. 53—412 **22 Claims**



1. A method for high speed production of a sealed package for storing, shipping and handling an individual service portion

of a spreadable product and for supporting said spreadable product for use after opening said package, comprising the steps of:

(a) continuously rotating a drum having a plurality of shaping stations located on the peripheral surface thereof, each of which includes a shaping cavity formed and substantially completely surrounded by a plurality of walls, at uniformly spaced intervals;

(b) continuously feeding a supply of indefinite length, flexible sheet material;

(c) continuously cutting individual predetermined lengths of said sheet material from said supply thereof;

(d) continuously feeding and directing individual predetermined cut lengths of said sheet material to each of said shaping stations at uniformly synchronized time intervals;

(e) synchronizing the movement of said shaping stations with the speed of said feeding and cutting of said sheet material so that each of said individual cut lengths thereof is deposited in centered register over one of said shaping cavities;

(f) applying a suction substantially completely about the perimeter of each of said shaping cavities so as to pick up and slidably hold the margin portions of said individual cut length of sheet material and cause said material to lie in a substantially flat configuration in centered register across said shaping cavity;

(g) bringing mechanical pressure into shaping register with said shaping cavity along a radial line extending through the axis of rotation of said rum and the center of said shaping cavity to force said sheet material into each of said shaping cavities without stretching during continuous movement of said shaping stations and while simultaneously continuing to apply said suction about the perimeter of said shaping cavity and synchronizing the movement of said mechanical pressure with the speed of said shaping station,

thereby causing said margin portions of said sheet material to slide longitudinally and transversely inwardly along the plane of the perimeter of said shaping cavity while said center portion thereof is pressed into said shaping cavity to form said sheet material into a three-dimensional cover member having

a substantially flat center portion,

a substantially flat margin portion extending laterally outwardly from said center portion in a separate plane generally parallel thereto, and

side walls connecting said center portion to said margin portion;

(h) removing said mechanical pressure from each of said formed three-dimensional cover members during continuous movement of said shaping stations and while continuing to apply said suction to said margin portion of said cover member, said suction fixedly retaining said cover member at said shaping station in said three-dimensional shape, said mechanical pressure is applied to and removed from each of said shaping cavities along said radial line throughout said shaping step while said drum and said shaping stations constantly rotate;

(i) inverting each of said shaping stations by the continued rotation of said drum to a position where each of said shaping stations is located directly above and in said moving register with one of said moving base members while said cover member is fixedly retained therein so that said center portion of said cover member is positioned above said margin portion thereof;

(j) at a station remote from said plurality of shaping stations, placing an individual service portion of a spreadable product on the approximate center of a substantially flat, relatively stiff base member having margins surrounding said spreadable product;

(k) continuously transporting said base members at uniformly spaced intervals into moving register with each of said inverted cover members fixedly retained at said shaping stations;

(l) releasing each of said inverted cover members from said shaping stations;

(m) compressing the margins of each of said released cover members on to the margins of one of said base members during said moving register therebetween so that said center portion of said cover member encloses said spreadable product carried on said base member; and

(n) removably sealably adhering said margin portion of said cover member to said margins on said base member to sealingly enclose said spreadable product therebetween.

4,449,351

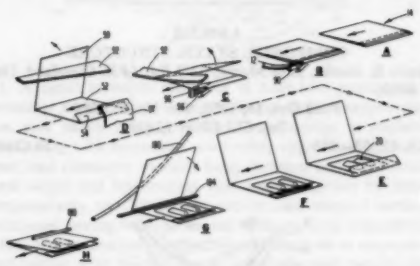
BLISTER PACK LOADING MACHINE

Matthew P. Henderson, East Rochester, N.Y., assignor to Pennwalt Corporation, Philadelphia, Pa.

Filed Jun. 22, 1981, Ser. No. 276,100

Int. Cl.³ B65B *43/38*

U.S. Cl. 53—569 **22 Claims**



1. Machine for automatically loading articles into covers comprising

endless conveyor means,

means for moving and interrupting movement of said conveyor means,

feeder means containing said covers in a folded condition mounted at one end of said machine,

means for withdrawing said folded covers from said feeder means for depositing said folded covers for transport with said conveyor means,

means for opening said folded covers,

magazine means mounted at other end of said machine for containing said articles,

means for withdrawing said articles from said magazine means,

means for inserting said withdrawn articles into said opened covers,

means for folding said covers over said inserted articles to secure said articles therewithin, and

other means for synchronizing said means for withdrawing said folded covers and means for withdrawing said articles with said means for moving and interrupting movement of said conveyor means, and

additional means cooperating with said means for withdrawing said articles from said magazine means and insertion means for heat-sealing said articles into said opened covers.

4,449,352

BEAN HARVEST APPARATUS

Douglas E. Brown, R.R. #1, Mazon, Ill. 60444

Filed Sep. 24, 1982, Ser. No. 422,648

Int. Cl.³ A01D *45/22, 46/00*

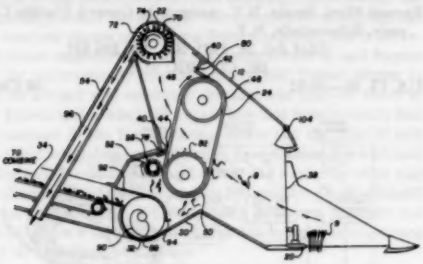
U.S. Cl. 56—13.1 **16 Claims**

1. A bean harvesting apparatus comprising a housing mounted on the forward end of a motorized combine; said housing being open along its leading edge for the reception of bean stalks;

power driven cutter means for the cutting of said bean stalks and thereby the deposition of said bean stalks in said housing;

power driven suction means for creating a vacuum in said housing means, thereby urging said bean stalks upwardly and into said housing;

a power driven conveyor belt disposed coincident with the longitudinal axis of housing; said conveyor belt being sufficiently porous to allow the drawing of a vacuum therethrough;



scraper means for scraping said bean stalks from said conveyor belt proximate the bottom thereof, thereby dropping said bean stalks into the bottom of said housing;

power driven auger means disposed proximate the bottom of said housing for the conveyance of said beans and bean stalks from said housing to said combine; and

exhaust means for the venting of air drawn into said housing by said suction means.

4,449,353

GUT STRING FOR SPORTS RACKETS

Amad Tayebi, Westford, Mass., assignor to United States Tennis Gut Association, Inc., Emerson, N.J.

Filed Aug. 6, 1982, Ser. No. 405,913

Int. Cl.³ D02G *3/10, 3/40, 3/44*

U.S. Cl. 57—242 **53 Claims**

1. A gut string for sports rackets, comprising at least two gut strands, each strand comprising a plurality of gut ribbons twisted together in a first direction, which strands are combined and retwisted in a direction opposite to the first direction.

4,449,354

DISC TYPE YARN TENSION CONTROL

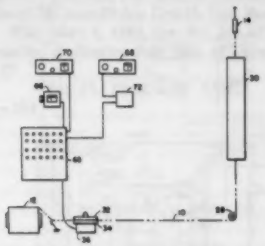
James R. Moore, Inman, and Charles E. Warner, Spartanburg, both of S.C., assignors to Milliken Research Corporation, Spartanburg, S.C.

Filed Oct. 18, 1982, Ser. No. 434,909

Int. Cl.³ D01H *7/18;* D02G *3/34;* D02H *13/22;* B05H *59/22*

U.S. Cl. 57—284 **11 Claims**

1. An electromagnetically actuated tension device comprising: an electromagnet, a post member operably associated with said electromagnet, a first metallic disc member mounted on said post, a second metallic disc member mounted on said post adjacent said first disc member, a D.C. circuit supplying D.C. voltage to said electromagnet and means supplying A.C. volt-



age to said electromagnet to periodically allow said first and second disc members to move relative to one another and relative to the electromagnet.

4,449,355

A.C.-D.C. SLOTTED TYPE YARN TENSION CONTROL

James R. Moore, Inman; William J. Schroder, Spartanburg; Charles E. Warner, Spartanburg, and Edgar H. Pittman, Spartanburg, all of S.C., assignors to Milliken Research Corporation, Spartanburg, S.C.

Filed Oct. 18, 1982, Ser. No. 435,053

Int. Cl.³ D01H *7/18;* D02G *3/34;* D02H *13/22;* B65H *59/22*

U.S. Cl. 57—284 **7 Claims**

1. An electromagnetically actuated tension device comprising: an electromagnet, a post member operably associated with said electromagnet, a first metallic disc member mounted on said post, a second metallic disc member mounted on said post adjacent said first disc member, means forming a yarn path in said post between said disc members which is off-set from the centerline of said post, a D.C. circuit supplying D.C. voltage to said electromagnet and means supplying an A.C. voltage to said electromagnet to periodically allow said first and second disc members to move relative to one another and relative to said electromagnet.

4,449,356

CONTINUOUS A.C. TENSION CONTROL

Charles E. Warner, Spartanburg, S.C., assignor to Milliken Research Corporation, Spartanburg, S.C.

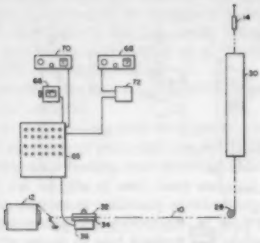
Filed Nov. 10, 1982, Ser. No. 440,498

Int. Cl.³ D01H *7/18;* D02G *3/34;* D02H *13/22;* B65H *59/22*

U.S. Cl. 57—284 **11 Claims**

1. An electromagnetically actuated tension device comprising: an electromagnet, a post member operably associated with said electromagnet, a first metallic disc member mounted on said post, a second metallic disc member mounted on said post adjacent said first disc member, a D.C. circuit supplying D.C. voltage to said electromagnet, means continuously supplying alternating current to said electromagnet and means in said

D.C. circuit to periodically and momentarily interrupt the flow of direct current to said electromagnet to periodically



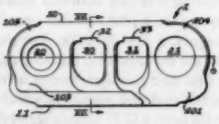
allow said first and second disc members to move suddenly relative to one another and relative to said electromagnet.

4,449,357

TRACK CHAIN LINK AND FORGING PROCESS FOR THE MANUFACTURE OF TRACK CHAIN LINKS

Paul Balitch, Grenoble, France, assignor to Caterpiller Tractor Co., Peoria, Ill.

Filed Jul. 14, 1982, Ser. No. 398,176
Claims priority, application France, Jul. 24, 1981, 81 14496
Int. Cl.³ B21L *3/04*
U.S. Cl. 59—30 **10 Claims**



1. A forging process for the manufacture of track chain links, including the steps of:

heating a metal billet (1') having a mass substantially equivalent to that of a finished link and the mass of the flash (1'') and burrs (1''') remaining after a subsequent levelling operation, said heating being carried out in an electric furnace;

preforming the heated billet (1') in a press to a first predetermined dimension, said first predetermined dimension being greater than final desired dimensions of the finished link in a heated state;

flat stamping the preformed piece to nominal dimensions of the finished link in a heated state;

simultaneously shaping and precision levelling the stamped piece in the heated state, including removing the burrs (1''') and flash (1'') from the link and forming a plurality of parallel articulation planes (101, 103, 104, 105) on lateral surfaces of the link;

controllably sizing the link (1) including forming an attachment mounting surface (10) and an opposed link contact surface in parallel relationship (11) at a predetermined distance one from the other;

hardening and tempering the sized link (1); and,

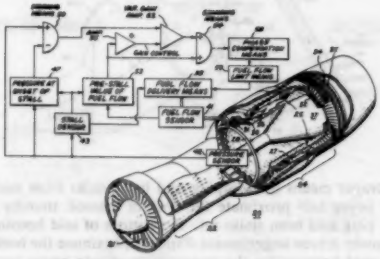
machining a pair of bores (20, 21) and drilling a pair of attachment holes (30, 31) for a track shoe in the hardened link (1).

4,449,358

METHOD AND APPARATUS FOR PROMOTING A SURGE CONDITION IN A GAS TURBINE

Ramani Mani, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Jul. 24, 1981, Ser. No. 286,431
Int. Cl.³ F02C *9/28*
U.S. Cl. 60—39.02 **38 Claims**



1. A method of promoting a surge condition in a stalled gas turbine engine having a combustor plenum disposed between a compressor and a turbine, comprising:

(a) monitoring pressure in said combustor plenum of said gas turbine engine;

(b) determining an onset of a stall in said gas turbine engine; and

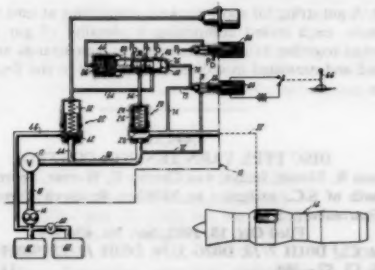
(c) modulating a time-varying component of a first operating parameter of said engine substantially in phase with a time-varying component of said combustor plenum pressure in response to and only after said onset of said stall, whereby a surge condition is promoted in said gas turbine engine.

4,449,359

AUTOMATIC VENT FOR FUEL CONTROL

Edward F. Cole, Glastonbury, and Dean H. Crombie, Ellington, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Jun. 26, 1981, Ser. No. 277,492
Int. Cl.³ F02C *9/28*
U.S. Cl. 60—39.094 **1 Claim**



1. A fuel system for a gas turbine engine having a burner and fuel feeding means including a fuel line interconnecting the fuel

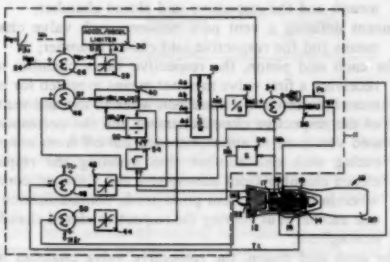
control and burner, at least a fuel tank and an alternate fuel tank and means for sequentially placing either fuel tank on line so as to interconnect with said fuel control, fuel pumping means in said fuel line interconnected to alternately either of said fuel tanks, in combination with said fuel control which has a minimum pressure and shut-off valve between the fuel metering means of the fuel control and said burner so that fuel is admitted to said burner solely upon reaching a predetermined minimum value, means for expunging trapped air captured in said fuel feeding means including a bypass line bypassing a portion of fuel metered by the fuel metering means around the minimum pressure and shut-off valve, means for actuating said fuel control, means including a fixed restriction and a moveable valve responsive to said actuating means in said bypass line for automatically interconnecting said bypass means to lead air around said minimum pressure and shut-off valve to said burner and a windmill bypass line that interconnects fuel downstream of the fuel metering means and the inlet of said pump and being disposed in parallel flow relationship with said minimum pressure and shut-off valve, and a selector valve also responsive to said actuating means for rendering said windmill bypass line operative whenever said minimum pressure and shut-off valve is actuated closed and said bypass line is actuated open to lead ait to said burner.

4,449,360

STALL DETECTOR AND SURGE PREVENTION FEATURE FOR A GAS TURBINE ENGINE

Rowland M. Evans, Terrasse Vaudreuil, Canada, assignor to Aviation Electric Ltd., Montreal, Canada

Filed Apr. 30, 1981, Ser. No. 259,317
Int. Cl.³ F02C 9/28
U.S. Cl. 60—39.281 **10 Claims**



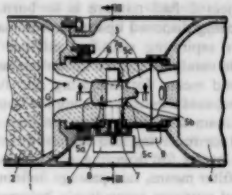
1. A fuel control system for a gas turbine engine comprising:
means for generating an actual speed signal proportional to the actual turbine speed of the gas turbine engine;
means for generating a scheduled speed signal proportional to a desired output power;
means for generating a demanded speed signal proportional to the time integral of a difference signal;
means for generating said difference signal proportional to the difference between said scheduled speed signal and said demanded speed signal;
means for generating an error signal proportional to the difference between said demanded speed signal and said actual speed signal;
means for controlling the fuel flow to the gas turbine engine as a function of said error signal;
means for generating a stall factor as a function of the difference between the rate of change of the demanded speed signal and the rate of change of the actual speed signal, said stall factor being indicative of the degree of stall the engine is experiencing; and
means for modifying the rate of change of the demanded speed signal as a function of the stall factor.

4,449,361

RAM JET ENGINE CONSTRUCTION AND A VALVE CONTROL FOR PROPORTIONING FUEL RICH GAS OF RAM JET ROCKET ENGINES

Thomas Hähnel, Ottobrunn, Fed. Rep. of Germany, assignor to Messerschmitt-Bölkow-Blohm GmbH, Fed. Rep. of Germany

Filed Mar. 4, 1982, Ser. No. 354,627
Claims priority, application Fed. Rep. of Germany, Apr. 15, 1981, 3115187
Int. Cl.³ F02K 9/00, 7/08
U.S. Cl. 60—254 **12 Claims**



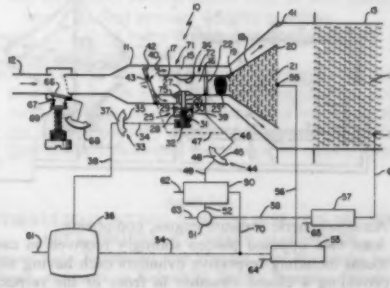
1. A valve particularly for controlling fluid flow between a precombustion chamber to a main combustion chamber of a ram jet engine, comprising a valve housing having a flow passage therethrough with a valve seat defining a throat area, a valve in said housing having at least one valve shaft portion journalled in said housing having a valve body portion extending across said passage, said valve body portion being fixed to said shaft portion for rotation therewith and being of a cylindrical wedge-shaped configuration tapering from a widest part adjacent one end to a narrowest part at a diametrically opposite end, said one end being of a size to completely close said throat area in a closed position and said diametrically opposite end being of a size to open at least a portion of said throat area in an open position.

4,449,362

EXHAUST SYSTEM FOR AN INTERNAL COMBUSTION ENGINE, BURN-OFF UNIT AND METHODS THEREFOR

Alfred A. Frankenberg, and Douglas R. Scott, both of Knoxville, Tenn., assignors to Robertshaw Controls Company, Richmond, Va.

Filed Dec. 2, 1981, Ser. No. 326,527
Int. Cl.³ F01N 3/02
U.S. Cl. 60—274 **26 Claims**



1. In an exhaust system for an internal combustion engine which burns a hydrocarbon fuel mixture and which produces a carbonaceous particle carrying exhaust gas stream that passes through a filter means of said system that retains at least part of said particles therein, said system having burn-off means for periodically burning said retained particles in said filter means to tend to periodically clean said filter means of said retained particles thereof, said burn-off means comprising means for raising the temperature of said exhaust gas stream intermediate

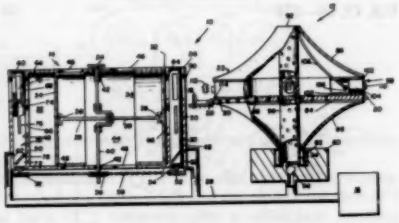
said engine and said filter means to raise the temperature of said filter means to particle burning temperature thereof, said means for raising the temperature of said exhaust gas stream comprising means for injecting and burning a certain amount of said fuel mixture in said exhaust gas stream intermediate said engine and said filter means, the improvement wherein said means for injecting and burning comprises means for aspirating said certain amount of said fuel mixture into said exhaust gas stream intermediate said engine and said filter means and said means for raising the temperature of said exhaust gas stream comprises an electrical heater means and a catalyst bed in which said injected fuel mixture is to burn, said electrical heater means being disposed upstream from said catalyst bed, said means for aspirating said fuel mixture being disposed upstream of said catalyst bed, said heater means being disposed intermediate said means for aspirating said fuel mixture and said catalyst bed, said means for raising the temperature of said exhaust gas stream also comprising passage defining means having an inlet for receiving said exhaust gas stream from said engine and an outlet for directing said received exhaust gas stream to said filter means, said passage defining means having first and second passages respectively between said inlet and said outlet, said catalyst bed and said heater means being disposed in said second passage, said means for aspirating said fuel mixture being disposed to feed said fuel mixture to said second passage upstream of said heater means therein, said passage defining means having valve means for directing said exhaust gas stream to said filter means only through said first passage during the time said filter means is not being cleaned and for directing said exhaust gas stream to said filter means through said second passage during the time said filter means is to be cleaned, said valve means comprising a first valve disposed in said second passage between said means for aspirating said fuel mixture and said heater means for closing said second passage between said inlet and said outlet and a second valve disposed in said passage defining means for closing said first passage between said inlet and said outlet.

4,449,363

ATMOSPHERIC PRESSURE MOTOR

Willard R. Custer, 1905 W. Washington St., Hagerstown, Md. 21740

Filed Jun. 10, 1981, Ser. No. 272,103
Int. Cl.³ F16D *31/02*
U.S. Cl. 60—370 **7 Claims**



1. An atmospheric pressure engine, comprising:
at least two opposed pistons slidingly received in casing means including respective cylinders each having means providing a closed chamber in front of the respective piston and being vented to atmosphere to the rear of the respective piston;
said casing means including valve chamber means for each piston;
a suction source communicated to each valve chamber means via a suction port, said suction source comprising a vacuum tank communicated to a suction line means that is communicated to the respective said suction ports of said valve chamber means;
vacuum pump means communicated to said suction source for replenishing said suction source by withdrawing air therefrom;
said vacuum pump means being constituted by a mechanical lung, comprising:
a base;
a rotor journalled for rotation on said base about an at least generally vertical axis;
means for rotating the rotor about said axis;
a plurality of equi-angularly distributed weights slidably mounted on the rotor for reciprocation along respective radial paths;
a cylinder mounted on said rotor sleeve for each weight, and sliding by each respective weight piston-fashion, each sleeve having an effectively open radially outer end, and a radially inner end;
means for modulating the rotational speed of said rotor;
mechanical means for retracting each piston upon braking or stopping of the rotor;
housing means sealingly communicated to the radially inner end of each rotor and conduit means connecting the housing means to said suction source, this conduit means incorporating a one-way check valve which opens said conduit means only for sucking air from said suction source, so that as said rotor is rotated with the weights retracted, the weights extend radially outwards in the respective cylinder sleeves due to centrifugal force, thus increasing the volume of, and therefore tending to decrease the pressure in, said housing means, and thus withdrawing air from the suction source, whereupon rotation of the rotor may be slowed or stopped and said mechanical means may be operated to retract the pistons for a next cycle of operation;
a vent port to atmosphere provided to each valve chamber means;
means defining a suction port between each valve chamber means; and the respective said closed chamber;
means defining a vent port between each valve chamber means and the respective said closed chamber;
for each said piston, the respective valve chamber means receiving a first valve member means mounted for movement between a first condition wherein the said vent port of the respective closed chamber and the corresponding said vent port to atmosphere are cut-off from communicating with one another thus isolating the respective closed chamber from atmosphere and a second condition wherein these two vent ports are in communication with one another thus venting the respective closed chamber to atmosphere;
for each said piston, the respective valve chamber means receiving a second valve member means including a cavity, said second valve member means being mounted for movement between a first condition wherein the cavity is communicated to the respective closed chamber via the respective suction port but said cavity is isolated from said suction source, a second condition wherein the cavity is communicated to the suction source via the respective suction port but said cavity is isolated from the respective closed chamber, and a third condition wherein the respective cavity is isolated from both the respective closed chamber and the respective suction source;
for each piston, first means coordinating movement of the respective first and second valve member means to repeatingly provide the following cycle:
that as the respective piston is in a fully retracted condition, and the respective cavity is at least partially evacuated and thus at below-atmospheric pressure, that cavity is communicated to the respective closed chamber causing the respective piston to at least partially extend;
that the respective cavity is then isolated from the respective closed chamber and first communicated to, then isolated from the suction source, in order to again partially evacuate the respective cavity; and
that after the respective piston has extended, the respec-

tive closed chamber is vented to atmosphere and then isolated therefrom;

second means coordinating the movement of the respective first and second valve member means for all of said at least two pistons to provide an even distribution of phases of operation at least so that for each two mutually opposed pistons, one is being caused to retract as the other is being caused to extend;

a crank shaft means journalled for rotation;

connecting arm means joining each piston to the crank shaft means so that coordinated reciprocation of said pistons produces rotation of said crank shaft means; and

rotary power take-off means connected to said crank shaft means to receive rotary power therefrom.

4,449,364

SLUING DRIVE FOR EXCAVATOR

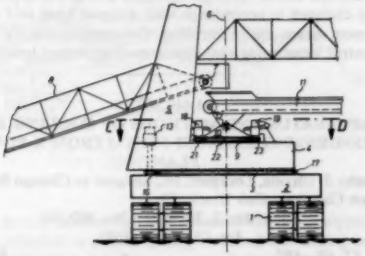
Reinhard Trümper, Offendorf, Fed. Rep. of Germany, assignor to O & K Orenstein & Koppel AG, Fed. Rep. of Germany

Filed Jan. 25, 1982, Ser. No. 342,142

Claims priority, application Fed. Rep. of Germany, Jan. 27, 1981, 3102532

Int. Cl.³ F16D *31/02*

U.S. Cl. 60—403 **14 Claims**



1. A sluing device for a machine having a carriage, a turntable rotatable about an axis to the carriage, a superstructure connected to the turntable, and a discharge boom assembly rotatably mounted to the turntable about the axis, comprising:

first drive means having at least one drive motor connected between the carriage and turntable for rotating the turntable;

second drive means connected between the turntable and boom assembly for driving the boom assembly, said first and second drive means connected to each other so that rotation of the turntable with respect to the carriage in one direction causes rotation of the boom assembly in an opposite direction by an amount to maintain a position of the boom assembly with respect to the carriage as the superstructure rotates with respect to the carriage; and

further drive means having a drive motor connected between the turntable and boom assembly for maintaining engagement between the turntable and boom assembly with failure of said second drive means, said further drive means motor providing a torque which is less than that provided by said at least one first drive means motor.

4,449,365

LIFT, TILT AND STEERING CONTROL FOR A LIFT TRUCK

Peter D. Hancock, Muskego, Wis., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Division of Ser. No. 95,923, Nov. 19, 1979, abandoned. This application Oct. 15, 1981, Ser. No. 311,592

Int. Cl.³ B62D *5/06*; F15B *11/16*, *13/06*

U.S. Cl. 60—422 **1 Claim**

1. A lift truck hydraulic control system for a lift truck of the type having a hydraulic lift cylinder controlled by a lift control valve having a lower position, a hold position and first and second pressure fluid delivery positions for expanding the lift cylinder, a hydraulic tilt cylinder controlled by a tilt control valve having a hold position and a pair of pressure fluid delivery positions for effecting expansion and contraction of said tilt cylinder and a steering mechanism including a hydraulic steering motor controlled by a steering control valve having a neutral position and fluid pressure delivery positions for effecting operation of the steering motor, the control system characterized by

first and second hydraulic pumps;

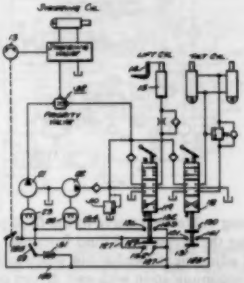
first and second electric motors connected in driving relation to said first and second pumps, respectively;

a single priority valve having

an input connected in fluid receiving relation to said first pump,

a high priority output connected in fluid delivery relation to said steering control valve and

a low priority output connected in direct fluid delivery relation to each of said tilt and lift control valves;



a fluid delivery circuit connecting said second pump in fluid delivery relation to said lift control valve independent of said priority valve;

first control means associated with each of said steering control valve, tilt control valve, and lift control valve for automatically causing said first electric motor to drive said first pump when at least one of the following three shifting movements occurs:

said steering control valve is shifted from its neutral position to one of its pressure fluid delivery positions,

said tilt control valve is shifted from its hold position to one of its fluid pressure delivery positions,

said lift control valve is shifted to its first pressure fluid delivery position; and

second control means automatically causing said second electric motor to drive said second pump when said lift control valve is moved to its second pressure fluid delivery position whereby said second pump delivers pressure fluid to said cylinder by way of said lift control valve.

4,449,366

HYDRAULIC CONTROL SYSTEM FOR OFF-HIGHWAY SELF-PROPELLED WORK MACHINES

Hideyori Sato, Funabashi, and Mitsuru Arai, Kawasaki, both of Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed May 29, 1981, Ser. No. 268,235

Claims priority, application Japan, May 30, 1980, 55-71491; May 30, 1980, 55-71492

Int. Cl.³ F16H *39/46*

U.S. Cl. 60—444 **5 Claims**

1. A hydraulic control system for an off-highway self-propelled work machine of the type having at least one variable displacement pump for delivering hydraulic fluid under pressure to at least one hydraulically driven component such as

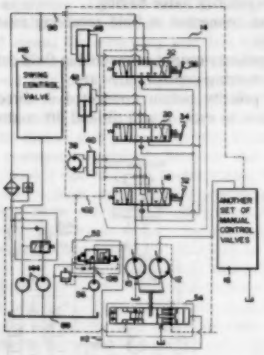
an implement actuator or a propelling motor, the control system comprising:

(a) a hydraulically actuated adjustment mechanism for reducing the per-cycle displacement of said pump to a minimum on actuation;

(b) at least one manual control valve for selectively placing said pump in and out of communication with said driven component;

(c) means provided to said manual control valve for producing a fluid pressure signal indicative of whether said pump is in or out of communication with said driven component;

(d) an additional source of fluid under pressure;



(e) a sensing valve responsive to the fluid pressure signal for directing the pressurized fluid from said additional source to said adjustment mechanism when said pump is placed out of communication with said driven component by said manual control valve;

(f) said signal producing means comprising a pilot port in communication with said additional pressurized fluid source via said sensing valve and a reservoir port placed in and out of communication with said pilot port depending upon whether said pump is in or out of communication with said driven components.

4,449,367

KNOCKING CONTROL DEVICE FOR TURBOCHARGED INTERNAL COMBUSTION ENGINE

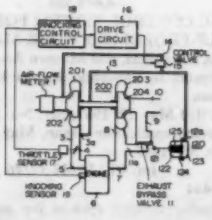
Koichi Moriguchi, Nagoya; Kenzi Iwamoto, Nishio; Ryuichi Matushiro, Okazaki; Hisasi Kawai, Toyohashi; Nobutaka Mizuno, and Yasuhiro Ikuta, both of Okazaki, all of Japan, assignors to Nippon Soken, Inc., Nishio and Toyota Jidosha Kabushiki Kaisha, Toyota, both of, Japan

Filed Jul. 14, 1982, Ser. No. 398,272

Claims priority, application Japan, Jul. 18, 1981, 56-111546

Int. Cl.³ F02B *37/00*

U.S. Cl. 60—602 **3 Claims**



1. A knocking control device for a turbocharged internal combustion engine, comprising:

intake pipe means for introducing air to an engine;

a throttle valve located in said intake pipe means;

turbocharger means including a compressor for supplying compressed air to the engine and an exhaust turbine for driving said compressor;

bypass pipe means provided so that the exhaust gas of the engine bypasses said exhaust turbine;

an exhaust bypass valve located in the middle of said bypass pipe means and controlling the exhaust gas bypassed through said bypass pipe means;

a diaphragm actuator for driving said exhaust bypass valve;

a pressure pipe for transmitting the pressure at the exit of said compressor to said diaphragm actuator;

a control valve for adjusting the pressure which is transmitted to said diaphragm actuator;

knocking sensor means for detecting knocking of the engine;

throttle sensor means for detecting the opening degree of said throttle valve; and

control means for receiving the output signals of said knocking sensor means and said throttle sensor means,

said control means controlling said control valve in accordance with a signal from said knocking sensor means so as to increase the opening degree of said exhaust bypass valve when knocking occurs and reduce the opening degree of said exhaust bypass valve when knocking does not occur,

said control means determining upper and lower limits which are changed in accordance with a signal from said throttle sensor means and controlling the opening degree of said control valve using said determined upper and lower limits.

4,449,368

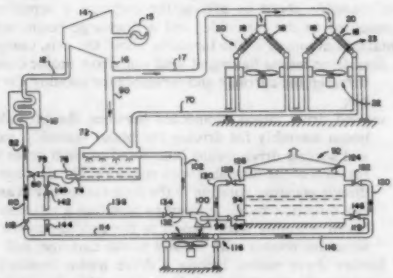
APPARATUS AND METHODS OF COOLING AND CONDENSING EXHAUST STEAM FROM A POWER PLANT

Timothy J. Haynie, Lockport, Ill., assignor to Chicago Bridge & Iron Company, Oak Brook, Ill.

Filed May 2, 1983, Ser. No. 490,536

Int. Cl.³ F01K *9/00*

U.S. Cl. 60—652 **6 Claims**



1. A method of operating a steam driven turbine comprising:

conveying a stream of the exhaust steam from the turbine to a primary cooling means to condense the steam and feeding the resulting condensate to a boiler for conversion to steam to drive the turbine so long as the heat rejection capacity of the primary cooling means is adequate to condense all of the steam;

supplementing the cooling capacity of the primary cooling means, when it provides inadequate cooling to condense all of the steam, by peak shaving cooling by contemporaneously also withdrawing boiler quality cold cooling water from a cold water reservoir and feeding the cold cooling water into the exhaust steam to thereby condense a sufficient portion of the steam to water such that the remaining portion of the steam is condensed to water by the primary cooling means;

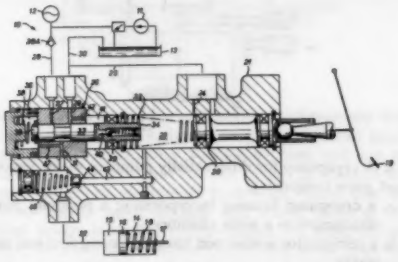
feeding part of the hot condensed water, from the primary cooling and the peak shaving cooling, directly to the boiler used to produce the steam which drives the turbine, and part of the hot condensed water to a hot water reservoir, during such times as the cooling capacity of the primary cooling means is supplemented as described; and when the cooling capacity of the primary cooling means has excess cooling capacity to condense steam, feeding cold condensed water from the primary cooling means to the cold water reservoir, and withdrawing hot water from the hot water reservoir and feeding it hot to the boiler.

4,449,369

POWER ASSISTED HYDRAULIC CONTROL SYSTEM

Jean L. R. Dauvergne, Fosses, France, assignor to Valeo Societe Anonyme, Paris, France

Filed Apr. 9, 1981, Ser. No. 252,292
Claims priority, application France, Apr. 15, 1980, 80 08374
Int. Cl.³ B60T *13/20*
U.S. Cl. 60—556 **10 Claims**



1. A power assisted hydraulic control system, comprising a master cylinder, a master piston mounted for sliding in the master cylinder and defining a control chamber, a hydraulic assistance unit including fluid-pressure means and a reservoir, a distributor having a slide-valve plunger one end of which is subjected to the pressure in said control chamber and the other end of which is subjected to the pressure in a receiver, said slide-valve plunger being adapted to place the receiver under pressure in response to pressure generated by the master piston in the control chamber, said slide-valve plunger and said master piston being disposed on opposite sides of said control chamber, a bypass channel connecting the control chamber of the master cylinder to a conduit connecting the distributor to the receiver, and a bypass valve controlling fluid flow through said bypass channel, said bypass valve being operated in response to two opposing pressures, one of which is the pressure in said receiver and the other of which is the pressure in the control chamber, whereby said bypass valve normally remains closed and opens only in case of failure of the power assistance, to permit manual emergency operation.

4,449,370

DIESEL ENGINE CATALYTIC COMBUSTOR SYSTEM

Lloyd W. Ream, N. Canton, Ohio, assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Jun. 6, 1980, Ser. No. 157,150
Int. Cl.³ F02B *37/00*; F01N *3/36*
U.S. Cl. 60—606 **3 Claims**

1. In combination with an intermittent combustion engine of the type having a turbocharger with a turbine wheel driven by engine exhaust gases directed thereto by an exhaust conduit and with a blower which provides air under pressure to said engine through an intake conduit, said blower being mechanically connected to said turbine:

(1) a catalytic combustor disposed in said exhaust conduit, and comprising:

an elongated housing having a closed end and an open end, said open end communicating with said turbine wheel, and further having slots which communicate with said engine through said exhaust conduit, said slots being disposed in said housing in the form of an annular row;

a catalytic element disposed at the open end of said catalytic combustor;

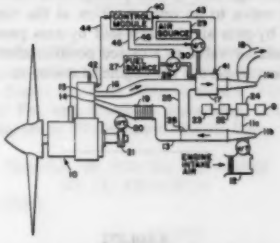
a cylindrical combustion chamber disposed between the closed end of said elongated housing and said slots which communicate with said engine;

means for injecting fuel into said combustion chamber;

means for injecting air into said combustion chamber;

means for igniting said fuel injected into said combustion chamber;

a flared apertured tube disposed coaxially outwardly of said combustion chamber and extending toward said



slots which communicate with said engine to inhibit flameout and to uniformly heat said catalytic element;

(2) a fuel supply connected to said means for injecting fuel through a first valve which may be closed to terminate injection of fuel into said combustion chamber;

(3) an air supply connected to said means for injecting air through a second valve which may be closed to terminate injection of air into said combustion chamber;

(4) means for automatically adjusting said first and second valves when said catalytic element attains a predetermined temperature whereby overheating of said catalytic element is prevented;

(5) means coacting with said means for adjusting said first and second valves to close said first and second valves when said catalytic element is at or above a temperature of 400° F. and said engine is operating whereby combustor restart is automatic when said first and second valves reopen; and,

(6) an intercooler disposed in said intake conduit to reduce the temperature of the air being provided to said engine.

4,449,371

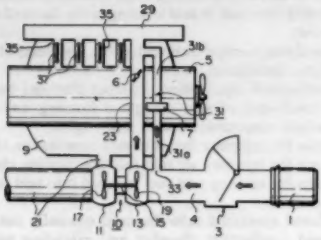
AIR BY-PASS SYSTEM IN AN INTERNAL COMBUSTION ENGINE WITH A SUPERCHARGER

Shigeru Sone, Toyota; Yasuhiro Ikuta, Okazaki; Kazuaki Komiya, Toyota; Kazuhide Kihira, Toyota, and Nobutaka Mizuno, Toyota, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Aug. 22, 1980, Ser. No. 180,421
Claims priority, application Japan, Jul. 1, 1980, 55/88470
Int. Cl.³ F02B *37/00*
U.S. Cl. 60—611 **1 Claim**

1. In an internal combustion engine with a turbocharger comprising an exhaust gas driven turbine in an exhaust pipe of the engine and a compressor in an intake pipe of the engine, said compressor being driven by the turbine to turbocharge suction air fed to the engine through a throttle valve in an air connecting pipe connecting the compressor to the engine, an air by-pass system comprising a suction air by-pass passage

fluidly connecting an area upstream from and in fluid communication with the compressor and an area downstream from and in fluid communication with the throttle valve, a temperature controlled air valve for controlling the amount of air to be



by-passed through said by-pass passage, and means for actuating the air valve to an open position at the time of engine ignition to by-pass air through said by-pass passage and for actuating said air valve to a closed position after a period of time sufficient to permit the engine to warm-up.

4,449,372

GAS POWERED MOTORS

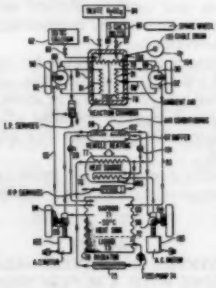
John W. Rilett, The Gables, Hawkers Hill, Bibury, Gloucestershire, England

Division of Ser. No. 72,561, Sep. 4, 1979, Pat. No. 4,327,533. This application Jan. 22, 1982, Ser. No. 341,881

Claims priority, application United Kingdom, Sep. 5, 1978, 35603/78

Int. Cl.³ F01K *25/10*

U.S. Cl. 60—671 **36 Claims**



1. In combination,

a gas-powered motor;

means for holding liquified gas;

means for evaporating said liquified gas;

conduit means to deliver gas from said evaporating means to said motor to power said motor;

receiving means for expanded gas from said motor;

condensing buffer substance means in thermal communication with the expanded gas flowing into said receiving means; and

refrigeration means to pump heat from and cool said condensing buffer substance means to a temperature low enough to condense said expanded gas.

4,449,373

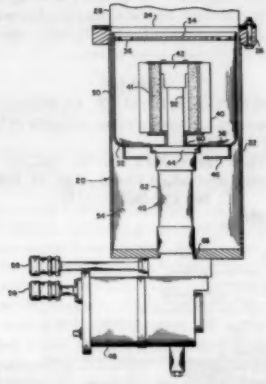
REDUCED VACUUM CRYOPUMP

John F. Peterson, Lynnfield, and Allen J. Bartlett, Milford, both of Mass., assignors to Helix Technology Corporation, Waltham, Mass.

Filed Feb. 28, 1983, Ser. No. 470,914

Int. Cl.³ B01D *8/00*

U.S. Cl. 62—55.5 **8 Claims**



1. A cryopump for differentially pumping water vapor and inert gases comprising:

a. a cryopump housing incorporating a pumping port for attachment to a work chamber;

b. a refrigerator within said housing having first and second stages;

c. a second stage cryopanel mounted directly to a low temperature heat sink on the second stage;

d. a radiation shield partially enclosing the second stage cryopanel, and in thermal contact with a higher temperature heat sink on the first stage;

e. a frontal inlet orifice plate extending across the pumping port and in thermal communication with the radiation shield, so as to act as part of the radiation shield, the orifice plate restricting flow of low condensing temperature gas from the work chamber to the second stage cryopanel in order to allow a moderate pressure of low condensing temperature gas in the work chamber while condensing higher condensing temperature gases; and

f. a gas flow path provided through the radiation shield at a position removed from the pumping port such that the radiation shield is surrounded by a vacuum at a lower pressure than the work chamber.

4,449,374

COMBINATION HOT GAS AND AIR DEFROST REFRIGERATED DISPLAY CASE

Fayez F. Ibrahim, Niles, Mich., assignor to Tyler Refrigeration Corporation, Niles, Mich.

Continuation-in-part of Ser. No. 225,997, Jan. 19, 1981, Pat. No. 4,338,792, which is a continuation-in-part of Ser. No. 60,459, Jul. 25, 1980, Pat. No. 4,295,340, which is a continuation-in-part of Ser. No. 8,111, Jan. 21, 1979, Pat. No. 4,329,852, Ser. No. 11,804, Feb. 14, 1979, abandoned, Ser. No. 25,350, Mar. 30, 1979, Pat. No. 4,308,726, Ser. No. 70,882, Aug. 29, 1979, and Ser. No. 308,147, Oct. 2, 1980, which is a division of Ser. No. 145,859, May 1, 1980, Pat. No. 4,314,457. This application Jul. 13, 1982, Ser. No. 397,692

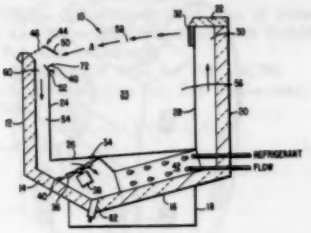
Int. Cl.³ A47F *3/04*

U.S. Cl. 62—81 **57 Claims**

56. In a refrigerated display case having a product display space and an unimpeded access opening thereto and at least one air conduit formed between front, bottom, rear and side

walls and spaced inner panels, and having a refrigeration coil means located within said air conduit; and an air moving means for propelling an air band in a first direction through said air conduit during a refrigeration cycle; the improvement comprising:

defrost means for enabling the supply of hot refrigerant gas to said refrigeration coil means and the formation of a unidirectional ambient air band for movement through said air conduit and about said refrigeration coil means during the entire defrost cycle and the formation of a defrost air band by heat exchange with said refrigeration coil means, said unidirectional ambient air band adapted for defrosting said air conduit and said refrigeration coil means simultaneously with the defrost by said hot refrigeration gas, said defrost means enabling said unidirectional ambient air band and said defrost air band to flow into and out of said air conduit in a manner to prevent ambient air from being forced into said product display space through said access opening, said defrost means including ejector means for enabling said defrost air band to be expelled outwardly away from said display space of said case, in order to avoid comingling with ambient air and contact thereof with products stored in said display space, and said cabinet having an open front wall which forms said access opening and wherein said ejector means is located near the bottom of said access opening.

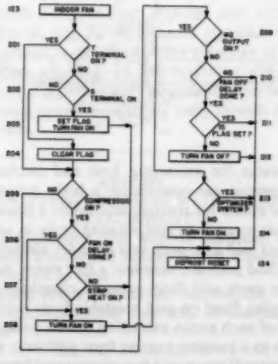


4,449,375

METHOD AND APPARATUS FOR CONTROLLING THE OPERATION OF AN INDOOR FAN ASSOCIATED WITH AN AIR CONDITIONING UNIT

Mario F. Briccetti, Liverpool, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.

Filed Mar. 29, 1982, Ser. No. 362,789
Int. Cl.³ F25D *17/06*
U.S. Cl. 62—89 8 Claims



1. A method of operating an air conditioning system including a refrigeration circuit having a compressor, a microprocessor control, a thermostat for sensing a need for heating or cooling including means for selectively operating an indoor fan continuously without regard to operation of the refrigeration circuit, said thermostat supplying a first signal to the microprocessor when fan operation is desired and a second signal to the microprocessor when compressor operation is desired which comprises the steps of:

energizing the indoor fan in response to the first signal from the thermostat;

energizing the compressor in response to the second signal from the thermostat;

setting an indicator when the first signal is sensed and the second signal is not sensed;

sensing if the thermostat is supplying a second signal and the compressor is not operating;

detecting if the indicator is set; and

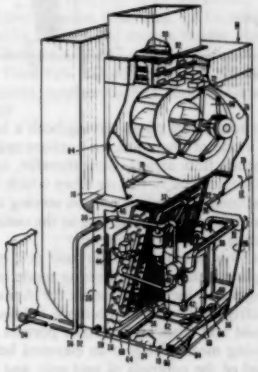
operating the fan continuously if the step of sensing determines the compressor is not operating and the thermostat is supplying a second signal and the step of detecting determines that the indicator is set.

4,449,376

INDOOR UNIT FOR ELECTRIC HEAT PUMP

Robert Draper, Churchill; Robert S. Lackey, Pittsburgh; Thomas J. Fagan, Jr., Penn Hills; Stephen E. Veyo, Murrysville, all of Pa., and Joseph R. Humphrey, Grand Rapids, Mich., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 18, 1983, Ser. No. 468,006
Int. Cl.³ F25D *23/12*
U.S. Cl. 62—259.1 6 Claims



1. An indoor unit of an electric heat pump, comprising:

first and second independent modules adapted to be connected in air flow communication in several different ways;

said first module being of right parallelopiped exterior form having a top face, bottom face, one and an opposite longitudinal faces, and one and an opposite lateral faces, and containing therein a refrigerant coil comprised of horizontally extending tubes and fins thereon disposed with their planes in a substantially vertical orientation, said coil extending longitudinally of said module and having its lower longitudinal edge adjacent one lower longitudinal corner of said first module, said coil being tilted inwardly to a degree that its upper longitudinal edge is adjacent the midpoint of the lateral dimension of said first module, said first module further containing a refrigerant compressor in the space adjacent the inner face of said coil;

a second module of right parallelopiped exterior shape having an inlet face and an outlet face, and a lateral dimension substantially the same as the lateral dimension of said first

module, the interior space of said second module being substantially split laterally into a first space and a second space, said first space containing a single width, single inlet blower having its inlet open to said second space and its outlet open at said outlet face;

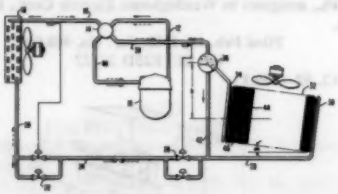
said second module being adapted to be mounted upon said first module in one position in which said blower is above said coil and air flow through said modules is in a sequence through said one longitudinal face of said first module, said coil and past said compressor to said blower inlet and, alternatively, mounted in another position 180° from said one position and in which said blower overlies said compressor and air flow through said module is in sequence through either of said lateral faces or said bottom face or said opposite longitudinal face, past said compressor, and through said coil to said blower inlet.

4,449,377

THERMOSYPHON COIL ARRANGEMENT FOR HEAT PUMP OUTDOOR UNIT

Robert Draper, Churchill, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 14, 1983, Ser. No. 474,934
Int. Cl.³ F25B *13/00*
U.S. Cl. 62—324.1 **6 Claims**



1. For an air-to-air heat pump having both a heating mode and a cooling mode of operation, an outdoor unit refrigerant coil and refrigerant flow arrangement therefor, comprising:

an extended surface coil of fins on tubes which have a slight upward inclination from one portion serving as the inlet of the coil to another portion serving as the outlet of the coil in the heating mode of said pump;

a refrigerant flow arrangement for said coil operable in a thermosyphon fashion in the heating mode of said pump, said arrangement including means for feeding said one portion refrigerant, means receiving refrigerant passed through said coil from said another portion of said coil, said receiving means being at an elevated height relative to the level of the centroid of said coil, and downcomer means connecting said receiving means to said feeding means to recirculate liquid refrigerant back to said coil in said heating mode of operation of said pump.

4,449,378

INSULATED CHEST

Kenneth J. Thorpe, Brooklyn, N.Y., assignor to Mitchell B. Shenkman, Brooklyn, N.Y.

Filed Jan. 20, 1982, Ser. No. 341,135
Int. Cl.³ F25D *3/08*
U.S. Cl. 62—371 **7 Claims**

1. An insulated chest, for the storage and transportation of hot and cold foods to be carried as a backpack comprising,

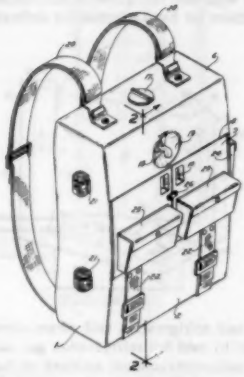
(a) a hollow box-like body portion having a top, bottom and four side walls made of heat insulating material, with one of the side walls having a first opening,

(b) a door made of heat insulating material adapted to be mounted on said body portion for closing said first opening,

(c) a removable first divider disposed in the interior of the body below the first opening in the side wall, which first divider is detachably connected to the side walls and spaced above the bottom wall, dividing the interior of the body portion into an upper and lower area,

(d) means attached to the exterior of the body portion for carrying the chest on a person's back,

(e) a second divider disposed in the interior of the body above the first opening which divider is sealingly attached to each of the side walls so as to define an upper chamber adapted to hold liquid,



(f) a spigot mounted to a side wall and extending through the side wall into the liquid-holding chamber,

(g) said top of the body having a second opening into the liquid-holding chamber through which the liquid-holding chamber can be filled with a liquid, and

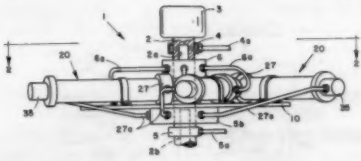
(h) means for sealing the second opening when liquid is in the liquid-holding chamber.

4,449,379

METHOD AND APPARATUS FOR EXTRACTING HEAT AND MECHANICAL ENERGY FROM A PRESSURED GAS

Edwin W. Dibrell, San Antonio, Tex., assignor to Centrifugal Piston Expander Inc., San Antonio, Tex.

Filed Oct. 25, 1982, Ser. No. 436,412
Int. Cl.³ F25D *9/00*
U.S. Cl. 62—401 **39 Claims**



1. Apparatus for extracting heat and mechanical energy from a pressured gas comprising: a body rotatable about an axis; power means for rotating said body; a plurality of cylinder elements secured to said rotating body in an equi-spaced array around said axis; each said cylinder element defining an elongated fluid pressure chamber; a free piston movable longitudinally in each said fluid pressure chamber; said cylinder elements being fixed on said rotatable body with the path of movement of each piston extending from a position proximate to said axis to a position remote from said axis; whereby centrifugal force will move said free piston to said remote position; inlet valve means communicating between a source of pressured gas and the remote end of each said cylinder element;

means for opening said inlet valve means only when said free pistons respectively approach said remote positions to receive a charge of pressured gas in the respective fluid pressure chamber; and exhaust valve means respectively communicating with said fluid pressure chambers and operable only when said free pistons respectively approach said proximate position, whereby each charge of pressured gas imparts rotational energy to said body and is discharged in a cooled expanded condition.

4,449,380

WARP KNITTED FABRIC AND PROCESS FOR ITS PRODUCTION

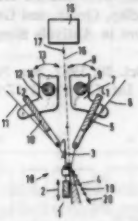
Christian Wilkens, Heusenstamm, Fed. Rep. of Germany, assignor to Karl Mayer Textilmaschinenfabrik GmbH, Obertshausen, Fed. Rep. of Germany

Filed Feb. 16, 1982, Ser. No. 348,796

Claims priority, application Fed. Rep. of Germany, Feb. 28, 1981, 3107816

Int. Cl.³ D04B *23/06*

U.S. Cl. 66—84 A **13 Claims**



1. A warp knitting machine using warp and weft threads, comprising:

a needle bed;

a least one forward thread system for forming stitches at said needle bed;

at least one rearward thread system for forming stitches at said needle bed, said rearward system being operable to move its warp thread into contact with said needle bed to enable said bed to grasp and pull into stitches the warp thread of said rearward thread system, said rearward thread system being successively operable to reciprocally form a common stitch with a corresponding pair of the warp threads of said forward thread system; and

weft thread laying means for repetitively laying said weft threads over the full length of the needle bed placing said weft threads between said forward and said rearward thread system, said forward thread system being successively operable to reciprocally lay a portion of each of its warp threads at one of two corresponding, alternate wales over at least one of said weft threads, said rearward thread system being operable to lay its warp threads behind said weft threads.

4,449,381

WARP KNITTING MACHINE WITH JACQUARD ATTACHMENT

Karl Kohl, Obertshausen, Fed. Rep. of Germany, assignor to Morton Jablin, Tenafly and Johann Winter, Paramus, both of, N.J., part interest to each

Filed Feb. 17, 1982, Ser. No. 349,625

Claims priority, application Fed. Rep. of Germany, Aug. 1, 1981, 3130555

Int. Cl.³ D04B *23/00*

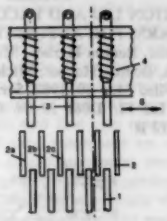
U.S. Cl. 66—203 **6 Claims**

1. A warp knitting machine with Jacquard attachment; comprising:

(a) a plurality of knitting needles arranged in spaced and side by side relationship;

(b) a plurality of eye-pointed needles arranged in spaced and side by side relationship and disposed for coaction with said knitting needles;

(c) each successive adjacent pair of said eye-pointed needles



including a first eye-pointed needle and a second eye-pointed needle;

(d) a plurality of urging feeder pins arranged in spaced and side by side relationship and disposed for coaction with said eye-pointed needles;

(e) their being only a single urging feeder pin for each said pair of eye-pointed needles.

4,449,382

WARP KNITTING MACHINE EQUIPPED WITH LATCH-TYPE NEEDLES

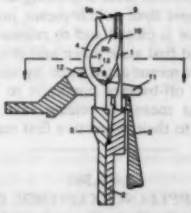
Karl Kohl, Obertshausen, Fed. Rep. of Germany, assignor to Morton Jablin, Tenafly and Johann Winter, Paramus, both of, N.J., part interest to each

Filed Feb. 17, 1982, Ser. No. 349,626

Claims priority, application Fed. Rep. of Germany, Aug. 20, 1981, 3132958

Int. Cl.³ D04B *23/00*

U.S. Cl. 66—203 **12 Claims**



1. A warp knitting machine equipped with latch-type needles each having a head extending to a predetermined height and each having a needle latch of predetermined length carried by the needle for movement in a predetermined orbit section about a latch pivot at a predetermined location thereon, a trace or stitch comb, a plurality of guide bars for underlapping purposes, and hole needles or guides; characterized by:

(a) keep-off rail means mounted behind at least several of the latch-type needles and for synchronized movement therewith;

(b) said keep-off rail means running from the hole needles or guides to the latch-type needles;

(c) said keep-off rail means extending in the direction of the height of the latch-type needles to an end located at a predetermined position which exceeds in height said predetermined location of said latch pivot;

(d) said keep-off rail means being of a predetermined configuration including at least a portion of said end which is

spaced from the latch-type needle a distance less than said predetermined length of said needle latch;

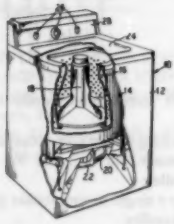
(e) said predetermined configuration of said keep-off rail means being such as to not interfere with the movement of the needle latches.

4,449,383

COMBINATION LID AND EXCURSION SWITCH AND ALARM FOR AUTOMATIC WASHERS

Roger J. Cartier, Benton Harbor, Mich., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed May 20, 1982, Ser. No. 380,087
Int. Cl.³ D06F *23/04, 33/02, 37/42*
U.S. Cl. 68—12 R **9 Claims**



2. An interruption control means with an audible alarm means for use with an appliance having an openable door and a power driven load carrying rotatable member susceptible to rotating in an off-balance manner comprising:

first switch means operable in a first state to disconnect power from said rotatable member;

second switch means operable in a first state to sound said alarm means;

a detection mechanism interconnecting said first and second switch means comprising a first lever means and a second lever means,

said first lever means normally biasing said second switch means into a second state and being acted upon by said door to bias said first switch means into a second state when said door is closed and to release said first switch means into said first state when said door is open;

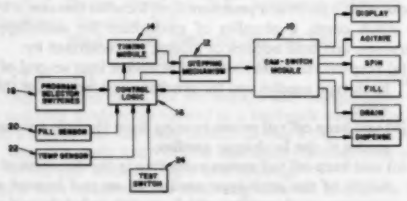
said second lever means acted upon by said rotatable member during an off-balance condition to in turn act upon said first lever means to release said first and second switch means to their respective first states.

4,449,384

WASHING APPLIANCE CONTROL CIRCUITRY

William H. Jones, Villa Park, Ill., assignor to Eaton Corporation, Cleveland, Ohio

Filed Aug. 4, 1982, Ser. No. 405,029
Int. Cl.³ D06F *33/02*
U.S. Cl. 68—12 R **8 Claims**



1. An electrical control circuit including an escapement device for controlling operation of a washing appliance comprising:

a source of electrical energy for powering said escapement device;

timer interval selector switch means for generating selective control signals;

timer decoder means for translating said selective control signals into associated timer signals, said decoder means comprising a binary-coded-decimal to decimal decoder/-driver in operative connection to a plurality of selected capacitance means and an interval timer, each of said plurality of selected capacitance means being selectively chargeable in response to an associated one of said control signals of said timer interval selector for associated selective control of said timer signals; and,

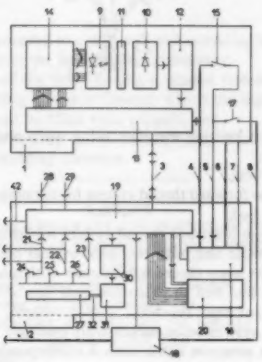
advancing circuit means for advancing said timer interval selector switch means in response to said timer signals of said timer/decoder means.

4,449,385

ELECTRO-MECHANICAL ANTI-THEFT DEVICE FOR AUTOMOBILE VEHICLES

Andre Thirion, Chevigny-Saint-Sauveur; Antoine Sorba, Le Mesnil Saint Denis; Jean-Claude Dany, Saint Cyr l'Ecole; Andre Pacaud, Saclay, Orsay, and Gerard Attal, Fresnes, all of France, assignors to Antivols Simplex, Dijon-Saint-Apollinaire, France

Filed Oct. 20, 1981, Ser. No. 313,151
Int. Cl.³ E05B *47/00*
U.S. Cl. 70—277 **11 Claims**



1. An anti-theft device for an automotive vehicle comprising:

electronic lock means comprising:

a coded key; control means for receiving said coded key and for activating said anti-theft device during introduction and extraction of said coded key; and reading means for reading the coded key in said control means and providing coded key signals corresponding to the code of the key; and

bolt means located in an inaccessable housing remote from said lock means and comprising:

a movable locking bolt; bolt actuator means for controling movement of said locking bolt; memory means for storing coded signals; comparator means for comparing the coded key signals with the stored coded signals from said memory means and providing an enable signal when the coded key signals correspond to the stored coded signals; signal responsive switch means for alternatively supplying and interrupting electrical operating power to force said vehicle; contact means responsive to positions of said locking bolt for providing corresponding bolt position signals; and electrical control means responsive to said enable signal and said bolt position signals for actuating said bolt actua-

tor means and for providing a signal to operate said switch means.

4,449,386

STEEL PIPE ROLLING MILL

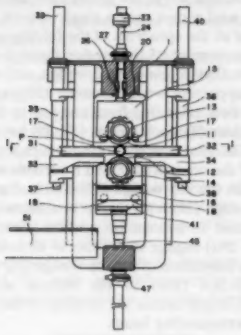
Shinji Akita; Masayuki Hatanaka, both of Yokohama, and Akira Uemura, Tokyo, all of Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 1, 1982, Ser. No. 394,110

Claims priority, application Japan, Jul. 10, 1981, 56-106873

Int. Cl.³ B21B *31/08*

U.S. Cl. 72—100 **6 Claims**



1. In a steel pipe rolling mill in which two cradles each holding a rolling mill roll are arranged one above the other and a heated material is passed between the top and bottom rolls thereby producing a hollow crude pipe, the improvement wherein a plurality of wheels are mounted on the lower surface of each of said top and bottom cradles, and wherein a supporting bed is vertically movably positioned below said bottom cradle and a track is provided on the upper surface of said supporting bed whereby when one of said cradles is placed on said supporting bed the wheels of said one cradle are engaged with said track thereby allowing transverse movement of said one cradle.

4,449,387

TUBE BENDING MACHINE

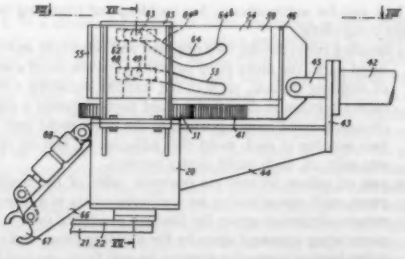
Anthony C. Hamill, Glasgow, Scotland, and Ronald J. Hawkins, Morden, England, assignors to Babcock Power Limited, London, England

Filed Dec. 15, 1981, Ser. No. 330,807

Claims priority, application United Kingdom, Dec. 17, 1980, 8040450; Apr. 1, 1981, 8110280

Int. Cl.³ B21D *7/04, 11/06*

U.S. Cl. 72—215 **11 Claims**



1. In a tube bending machine having a body with shaft means rotatably mounted therein and first and second arms carried by said shaft means with the first arm holding a roller means for engaging a tube and serving as a bending fulcrum for said tube and the second arm holding a roller means for engaging the tube to apply a bending moment to the tube about said bending fulcrum in the operation of said machine contemporaneous with operating means imposing an angular movement on said shaft means about its axis to effect an arcuate bending of the tube, the improvement comprising said shaft means including a first shaft with said first arm carried thereby and a second shaft with said second arm carried thereby, one of said shafts being rotatably mounted in said body and coaxially mounting the other of the said shaft, said mountings allowing independent axial movements of said arms, a first and second cam means carried by said body with said first cam means arranged to impose a predetermined axial movement on the first shaft simultaneously with the rotary movement thereof and said second cam means arranged to impose a predetermined axial movement on the second shaft simultaneously with the rotary movement thereof whereby operation of the machine effects a predetermined non-planar arcuate bending of the tube.

4,449,388

METHOD OF BENDING SHAPED METAL SHEET AND APPARATUS FOR CARRYING OUT THE METHOD

Seard Aberg, Gammelstad, Sweden, assignor to Groko Maskin AB, Stockholm, Sweden

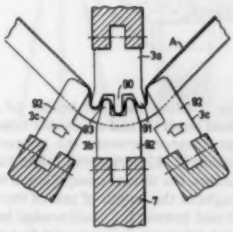
PCT No. PCT/SE81/00054, 371 Date Oct. 27, 1981, 102(e) Date Oct. 27, 1981, PCT Pub. No. WO81/02535, PCT Pub. Date Sep. 17, 1981

PCT Filed Mar. 2, 1981, Ser. No. 315,609

Claims priority, application Sweden, Mar. 4, 1980, 8001670-2

Int. Cl.³ B21D *7/06*

U.S. Cl. 72—381 **2 Claims**

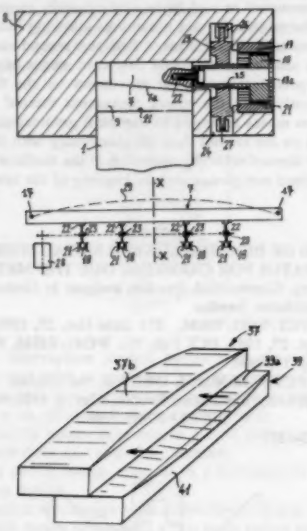


1. An apparatus for bending a sheet metal shape having at least one corrugation formed by interspaced ridges and a valley between the ridges, about an axis perpendicular to the corrugation, by forming a plurality of adjoining sheet-bending corrugations inwardly in the valley, the apparatus comprising a primary die and a punch positioned cooperatively opposite to each other and adapted to be moved together when the shape is positioned transversely between them with the inside of the valley in contact with the primary die, the primary die having two interspaced fingers which transversely engage said inside and the punch having three fingers which contact the valley's outside and mesh with the primary die's fingers when the primary die and punch are closed together, actuating means for moving the primary die and punch together so as to form one and on both sides thereof partially form two more of the sheet-bending corrugations in the valley and partially bend to shape about said axis, means for holding the primary die and punch together so as to clamp the shape's valley therebetween, and secondary dies on both sides of said primary die and which are movable towards the valley's inside so as to overlap the punch's two outer fingers, and means for moving said secondary dies towards the punch so as to bend the shape's valley about the punch's two outer fingers and completely form three bending corrugations in the shape's valley.

4,449,389
DEVICE FOR BENDING A TOOL HOLDER OF A FOLDING PRESS OR THE LIKE

Pierre Cros, Saint-Cloud, France, assignor to Promecam Sisson-Lehmann, Saint-Denis, France

Filed Jun. 3, 1982, Ser. No. 384,662
Claims priority, application France, Jun. 16, 1981, 81 11805
Int. Cl.³ B21D 9/05
U.S. Cl. 72—389 8 Claims



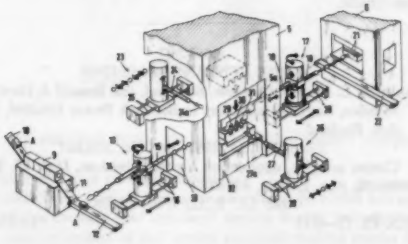
1. Device for bending the tool holder of a folding press comprising a fixed beam (1) and a movable beam (2) adapted to keep a constant distance between the cooperating tools fastened to said beams (1, 2) during the folding of a sheet metal between said beams, the device comprising a single wedge (7) extending throughout the length of one of the tool holders (8) associated with said beams (1, 2), said wedge having one major face (7*a*) inclined transversely to the folding direction and in sliding bearing engagement with a supporting member (9), and means for exerting transverse thrusts at different points disposed at spaced intervals along said wedge (7) in order to cause an elastic deformation of said wedge (7) by causing its inclined face (7*a*) to slide and thus bend the tool holder (8) and the tool carried thereby, wherein the means for controlling the deformation of said wedge (7) comprise at each transverse thrust point a hollow screw (18) engaged in a socket (21) rigid with the tool holder (8) but adapted to move only axially in said socket (21), a member (22) for securing said screw (18) to the wedge (7), a sprocket (23) mounted coaxially to said screw (18) and formed with internal screw threads engaging the male threads of said screw (18), for controlling the axial position of said screw (18) in said socket (21), and a single system (26) for controlling the rotation of all the sprockets of the folding press and consequently the movement of the wedge through the thrusts exerted by said hollow screw (18) on said wedge (7), said exerting means moving different portions of said wedge different distances upon actuation of said single system thereby to deform the wedge.

7. Device for bending the tool holder of a folding press comprising a fixed beam and a movable beam adapted to keep a constant distance between the cooperating tools fastened to said beams during the folding of a sheet metal between said beams, the device comprising a single wedge extending throughout the length of one of the tool holders associated with said beams, said wedge having one major face inclined transversely to the folding direction and in sliding bearing engagement with a supporting wedge member, and means for exerting transverse thrusts at different points disposed at spaced intervals along said wedge in order to cause an elastic deformation of said wedge by causing its inclined face to slide and thus bend the tool holder and the tool carried thereby, wherein the means for controlling the deformation of said wedge comprise at each transverse thrust point a hollow screw engaged in a socket rigid with the tool holder but adapted to move only axially in said socket, a member for securing said screw to the wedge, a sprocket mounted coaxially to said screw and formed with internal screw threads engaging the male threads of said screw, for controlling the axial position of said screw in said socket, and a single system for controlling the rotation of all the sprockets of the folding press and consequently the movement of the wedge through the thrusts exerted by said hollow screw on said wedge, said movable wedge (37) and its supporting wedge member (39) consisting of two identical members extending from one end to the opposite end of the tool holder (8), each wedge (37, 39) having a longitudinal surface (37*a*, 39*a*) coupled to the corresponding longitudinal surface of the other wedge and a variable transverse slope such that when the top wedge (37) is turned upside down on the bottom wedge (39) with the vertical faces (40, 41) of both wedges disposed in a common vertical plane, said coupled surfaces (37*a*, 39*a*) engage each other at all points thereof, and the transverse translation of the top wedge (37) on the variable-inclination surface (39*a*) of the bottom wedge (39) and throughout its length causes the bending of the top wedge (37) and of the corresponding beam.

4,449,390
AUTOMATIC UNIT FOR HOT MOLDING AND TRIMMING OF METAL PARTS

Giovanni Pontini, Turin, Italy, assignor to Teksid, S.p.A., Turin, Italy

Filed Dec. 14, 1981, Ser. No. 330,070
Claims priority, application Italy, Dec. 29, 1980, 69005 A/80
Int. Cl.³ B21J 9/00
U.S. Cl. 72—405 4 Claims



1. A unit for automatically hot molding and trimming metal parts comprising:

a molding press having two opposed and relatively movable mold parts, the mold parts defining between them a series of molding stations, each of the stations including a mold cavity portion in one of the mold parts opposite a corresponding mold cavity portion in the other mold part and two notches in each mold part adjacent to, and on opposite sides of, each mold cavity portion,

a pair of robots located on opposite sides of the molding press, each robot having an arm terminating in a gripping means adapted to grasp the flashing produced on a workpiece being operated upon by the molding press, and each robot having means for moving its arm from one molding station to the next in sequence and in synchronization with movement of the other robot arm,

the notches being so sized and shaped that at each molding station, the end of each gripping means, carried by each arm, is fully accommodated within the opening defined by two opposed notches in the mold parts when the mold parts are closed, so that the arms need not be moved prior and subsequent to closing of the mold parts when a molding operation is performed on a workpiece, and

means for trimming the workpiece after it has been operated upon in the last of the series of molding stations.

4,449,391

METHOD FOR SEPARATING CLOSED BOLLS OF COTTON BY MATURITY

William S. Anthony, Stoneville, Miss., assignor to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Jun. 4, 1982, Ser. No. 385,162

Int. Cl.³ G01N *9/10, 9/36*

U.S. Cl. 73—32 R **8 Claims**

1. A method for separating or classifying closed bolls of a given variety of cotton by maturity comprising:

(a) receiving unopened cotton bolls harvested from an agricultural field;

(b) immersing said bolls of cotton in a series of solutions, said solutions having a specific gravity of less than one, and thus separating said bolls by means of the differences in the specific gravity readings;

(c) correlating said specific gravity readings with moisture content of the bolls and subsequently translating said moisture content into known maturity dates of said cotton bolls.

4,449,392

DEVICE FOR TESTING FILTERS, PARTICULARLY STERILE FILTERS

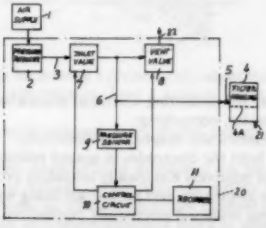
Bruno Huschke, Hauptstr. 12, D-8931 Reichertshofen, Fed. Rep. of Germany

Filed Apr. 29, 1982, Ser. No. 373,309

Claims priority, application Fed. Rep. of Germany, May 2, 1981, 3117399

Int. Cl.³ G01M *3/26*

U.S. Cl. 73—40 **7 Claims**



1. In a device for testing a filter, including a filter housing having an air inlet and an air outlet and adapted to receive a filter which is to be tested, an inlet line connected to said air inlet, the air pressure in said inlet line being regulated by an inlet valve, and means for recording the air pressure in said inlet line; the improvement comprising: pressure-regulating means capable of producing a continuous and evenly increasing air pressure in said inlet line, including an electronic pressure sensor which monitors the air pressure in said inlet line, an electronic evaluating and control circuit having a time switch, an adjustable threshold device for effecting pressure adjustment and a peak pressure sensor, said evaluating and control circuit controlling said inlet valve and being responsive to said electronic pressure sensor, said adjustable threshold device and said peak pressure sensor; and including a vent valve which is connected to said inlet line and said recording means and is controlled by said evaluating and control circuit; said pressure regulating means causing the air pressure to increase in said inlet line until it reaches a preselected pressure-resisting test pressure which can be adjusted by means of said adjustable threshold device, said inlet valve then being closed by said pressure regulating means for a time interval set on said time switch, a further increase of the air pressure in said inlet line then being effected by said pressure regulating means until said peak pressure sensor indicates no further air-pressure increase is occurring, thereby indicating a bubble point has been reached, said peak pressure sensor then causing said evaluating and control circuit to open said vent valve and simultaneously close said inlet valve.

4,449,393

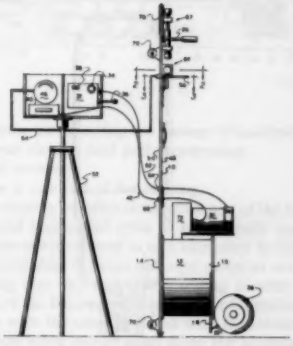
ENERGY (TEST) DOOR

Jeffrey C. Tucker, 4216 - 50th St., Suite F, Lubbock, Tex. 79413; H. Dale Edmundson, P.O. Box 1416, Grants, N. Mex. 87020; David L. Wigley, and Mark F. Vallo, both of 4216 - 50th St., Suite F, Lubbock, Tex. 79413

Filed Nov. 16, 1981, Ser. No. 322,019

Int. Cl.³ G01M *3/26*

U.S. Cl. 73—40 **1 Claim**



1. A door adapted to be mounted in the doorway of a house comprising:

a. a main panel having

i. an inside face, and

ii. an outside face

b. a fan housing attached to the outside face of the main panel,

c. a fan housing having a

i. a yoke side, and

ii. a door side which is the side attached to the main panel,

d. a yoke attached to the yoke side of the fan housing,

e. an axle attached to the yoke,

f. wheels journaled to said axle,

g. a fan journaled within said fan housing

h. a motor supported on said fan housing and having driving relationship with said fan,

i. a speed controller electrically connected to said motor for controlling the speed thereof,

j. a tachometer connected to said motor for indicating the speed thereof,

k. a differential pressure gauge inside of the door having a probe extending to the outside face of the door,

l. rollers attached to the inside face of the main panel,

m. a side flap slidingly attached to the side of the main panel,

n. a top flap slidingly attached to the top of the main panel,

o. each of said flaps having a core,

p. each of said flaps having a metal plate attached to either side of the core and straddling the main panel,

q. a corner flap slidingly attached to the top flap,

r. thumb screws to hold the corner flap in adjusted position.

s. spring means for biasing the top and side panels outward,
t. each spring means including a spring within
u. a tube secured to the main panel,
v. said springs biasing a plunger outward,
w. said plunger being telescoped within said tube and attached to one of said flaps,
x. latch means interconnecting each of the flaps on said main panel for holding the flaps in a retracted position,
y. rubber seal means extending along the outer edges of the flaps and the exposed edge of the main panel for providing an air seal between the door and the doorway, and
z. post attached to the outside face of the main panel near the top thereof whereby the air leakage of the house is determined by the motor speed and differential pressure.

4,449,394

EFFLUX VISCOSITY CUP

Allan J. Hegedus, Bolingbrook, Ill., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 327,547, Dec. 4, 1981, Pat. No. 4,400,973. This application Feb. 26, 1982, Ser. No. 352,624

Int. Cl.³ G01N *11/04*

U.S. Cl. 73—55 **9 Claims**

1. In an efflux viscosity cup consisting essentially of a cup-like resevoir externally and communicatively joined at its bottom to a capillary, a collar coaxially oriented with said capillary and attached at one open end to said bottom of said resevoir, said collar having an internal diameter substantially larger than the external diameter of said capillary and a height sufficient to extend it beyond the capillary thereby protecting the exit orifice of said capillary from damage, the improvement whereby increasing the accuracy of the viscometer, which comprises:

including one or more apertures in said collar, the size and location of said apertures being effective to substantially reduce the standard deviation of measurements made with said viscometer.

4,449,395

PHEOLOGICAL MEASUREMENT METHOD AND APPARATUS

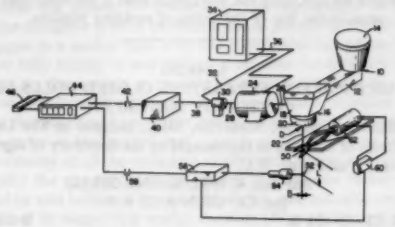
Stuart J. Kurtz, Martinsville, N.J.; Terry A. De Rossett, Hastings-on-Hudson, N.Y., and Montgomery T. Shaw, Mansfield Center, Conn., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Apr. 8, 1982, Ser. No. 366,723

Int. Cl.³ G01N *11/04*

U.S. Cl. 73—56 **4 Claims**

1. The method for testing a product stream of molten thermoplastic material to obtain a viscosity measurement and an elasticity measurement for said material comprising: passing a fractional, continuous, molten and flowable sample of such stream of said material to and successively through each of either a controllable pumping zone maintained at constant temperature and pressure or controllable pressure zone maintained at constant flow rate and temperature, and a die zone to form a continuous strand of such material of any resultant shape; measuring the viscosity of said material in said pumping



and die zones; providing a measurement of elasticity by obtaining a measurement or percentage of cross-section area swell in said strand in passage from said die zone over a constant length distance downstream of a point of strand marking to a point of mark sensing; and combining said viscosity measurement with said elasticity measurement to provide fuller rheological characterization data for said material.

4,449,396

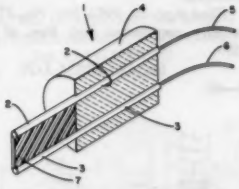
PROBE FOR MEASURING ELECTRICAL CONDUCTANCE

Joseph A. Bzdula, Fulton, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.

Filed Mar. 1, 1982, Ser. No. 353,768

Int. Cl.³ G01N *27/06*

U.S. Cl. 73—61.1 R **5 Claims**



1. A probe for measuring electrical conductance of a fluid containing water, comprising:

a pair of electrically conducting electrodes;

means to hold the electrodes in spaced relationship; and

a bridge of relatively electrically insulating protein gel spanning the electrodes, said protein gel being water absorbent and being rendered electrically conductive in proportion to the amount of water absorbed and said protein gel including a mixture of gelatin and a water permeable substance which provides rigidity for the gelatin to prevent erosion of the gelatin by fluid flow around the probe.

4,449,397

APPARATUS FOR MEASURING THE MASS OF A PULSATING MEDIUM FLOWING IN A FLOW CROSS-SECTION

Heinz Lauterbach, Esslingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Aug. 17, 1982, Ser. No. 408,979

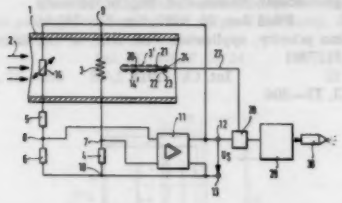
Claims priority, application Fed. Rep. of Germany, Sep. 10, 1981, 3135794

Int. Cl.³ G01F *1/68*

U.S. Cl. 73—118 **7 Claims**

1. An apparatus for measuring the aspirated air mass of

internal combustion engines, which represents a pulsating flowing medium, comprising at least one temperature-dependent measuring resistor disposed in the flow cross-section, the temperature and resistance of which is regulated in accordance with the flowing mass and a regulator output measurement



signal (U_S), a pressure-sensing element which is subjected to the flow medium, said pressure-sensing element producing an output which influences the measurement signal (U_S) representing the flowing mass of medium in accordance with the direction of flow of the medium.

4,449,398

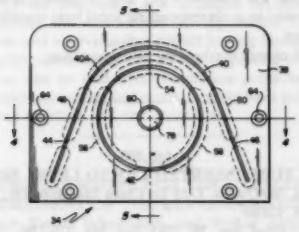
SHEET PROPERTY SENSOR WITH SHEET WRINKLE REMOVER

Paul Williams, Columbus, Ohio, assignor to Accuray Corporation, Columbus, Ohio

Filed Jun. 24, 1982, Ser. No. 391,496

Int. Cl.³ G01B *13/06*

U.S. Cl. 73—159 **6 Claims**



1. Apparatus for sensing a property of a sheet that is moving longitudinally downstream along a nominal sheet path, comprising

a sensor element adapted to be placed alongside the sheet path,

a base member adapted to be positioned on one side of the sheet and in sliding contact with one surface thereof,

traversing means for guiding the sensor element and the base member for movement generally along at least one nominal sensor path transverse to the sheet path so that the sensor element is enabled to produce a sheet property sensing interaction with the sheet in a limited region of the sheet path, the interaction region being movable to any one of a plurality of sensing locations spaced across the width of the sheet,

the base member having a pair of groove portions forming gas conducting channels with open sides exposed to the sheet surface in contact with the base member, each of the groove portions having a part extending upstream of the interaction region with respect to the sheet movement, the groove portions diverging from each other as they extend in the downstream direction with respect to the sheet movement, and

a source of subambient gas pressure communicating with the groove portions for reducing the gas pressure therein so that the contacting surface of the sheet is at least nominally depressed into the groove portions to such an extent that the divergence of the grooves and the longitudinal movement of the sheet exert thereon a transverse tension sufficient to substantially smooth out longitudinally extending wrinkles from a portion of the sheet at least slightly wider than the interaction region during the approach of the sheet portion thereto.

4,449,399

APPARATUS FOR DETECTING THE PASSAGE OF MULTIPLE SUPERPOSED DOCUMENTS ALONG A FEED PATH

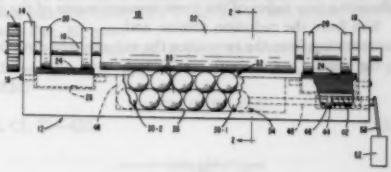
David A. Hain, Monifieth, Scotland, assignor to NCR Corporation, Dayton, Ohio

Filed Sep. 2, 1982, Ser. No. 414,152

Claims priority, application United Kingdom, Jan. 12, 1982, 8200793

Int. Cl.³ G01B *5/06*; B65H *7/12*

U.S. Cl. 73—159 **9 Claims**



1. An apparatus for detecting the passage of multiple superposed documents along a feed path, comprising:

an elongated housing;

a stop means at one end of the housing;

a movable actuating member at the other end of the housing;

first and seond superposed rows of substantially non-compressible elements retained in said elongated housing, the elements extending between said stop means at one end of the housing and said movable actuating member at the other end of the housing with each row of elements being in contact with the other row and with the centers of all the elements being spaced apart along the housing;

roller means having a fixed axis of rotation and postioned in contact with, and extending along the length of, said first row of elements;

means for urging said actuating member into engagement with the end element at said other end of said housing whereby the end element at said one end of said housing is urged against said stop means;

means for feeding documents along said feed path between said roller means and said first row of elements in a direction transverse to the axis of said roller means whereby there is brought about a movement of said actuating member away from said stop means; and

means for detecting a movement of said actuating member away from said stop means in excess of a predetermined amount.

4,449,400

RADIONUCULIDE COUNTING TECHNIQUE FOR MEASURING WIND VELOCITY AND DIRECTION

Jag J. Singh, Yorktown, Va., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Nov. 24, 1982, Ser. No. 444,149

Int. Cl.³ G01F *1/28*; G01W *1/00*

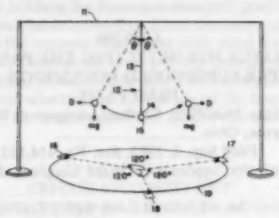
U.S. Cl. 73—189 **5 Claims**

1. A method for measuring wind velocity and direction comprising the steps of:

providing a radiation source on the end of a pendulum with the pendulum being substantially perpendicular to the wind direction when in its no wind position and with the

pendulum moving the radiation source to a position indicative of both the velocity and direction of the wind when there is wind;

measuring the radiation from the radiation source at three equally spaced locations on a circle in a plane perpendicular to said pendulum in its stable position;



obtaining two ratios of the three measurements of the radiation from the radiation source; and

determining from the two ratios the velocity and direction of the wind.

4,449,401

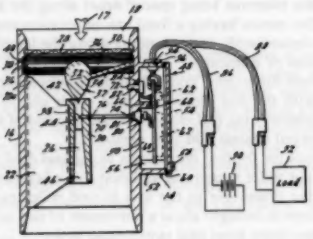
HOT FILM/SWIRL FLUID FLOWMETER

Hermann Kaiser, Utica, and Jerry A. Olson, Dearborn, both of Mich., assignors to Eaton Corporation, Cleveland, Ohio

Filed May 19, 1981, Ser. No. 265,119

Int. Cl.³ G01F *1/68, 5/00*

U.S. Cl. 73—202 **42 Claims**



1. A fluid flowmeter comprising:

means defining a main passage for the flow of a fluid therethrough;

means defining a secondary passage extending substantially parallel to said main passage and including an inlet for receiving a portion of the fluid flowing in said main passage, a throat and an outlet for discharging the portion back into the main passage;

a constant temperature thermal anemometer operative to monitor the rate of flow of said portion while within said throat and to generate a total flow rate output signal as a function thereof; and

means operative to receive at least a portion of the remaining fluid in said main passage and impart a velocity vector thereto tangential to said axis for creating a reduced pressure area at the outlet of said secondary passage.

4,449,402

APPARATUS FOR MEASURING THE FLOW VELOCITY OF GASES AND LIQUIDS

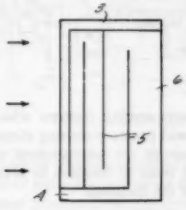
Kurt Eiermann, Pfungstadt; Eberhard Horlebein, Mainaschaff; Kurt Lissmann, Rodenbach, and Wolfgang Schafer, Frankfurt, all of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Hanau, Fed. Rep. of Germany

Filed Jun. 14, 1982, Ser. No. 388,463

Claims priority, application Fed. Rep. of Germany, Jul. 9, 1981, 3127081

Int. Cl.³ G01F *1/68*

U.S. Cl. 73—204 **7 Claims**



1. An anemometer apparatus for the measurement of velocity of a flowing medium comprising:

a temperature dependent electrical film resistance positioned so as to be in heat contact with said flowing medium, said resistance comprising an electrically insulating carrier and a thin metal layer formed on said carrier, said thin metal layer being cut to define resistance paths dimensioned such that the resistance per unit of surface area is a constant ratio to a corresponding local heat transfer coefficient; and

a control circuit for heating said resistance.

4,449,403

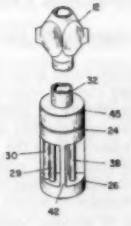
GUIDE TUBE INSERTED LIQUID LEVEL SENSOR

Malcolm M. McQueen, 1755 La Costa Meadows Dr., San Marcos, Calif. 92069

Filed Jun. 29, 1981, Ser. No. 278,336

Int. Cl.³ G01F *23/22*

U.S. Cl. 73—295 **7 Claims**



1. A system for sensing fluid level and properties in a vessel comprising a plurality of spaced resistance temperature detector sensor assemblies, each sensor assembly comprising a first and second temperature sensor, a heater adjacent one temperature sensor and isolated from the second temperature sensor, means for detecting differential heat responses between the temperature sensors, means to measure differential heat responses between the temperature sensors and means to sense individual temperatures of the two temperature sensors of each sensor assembly.

4,449,404

THERMOELECTRIC LEVEL MEASURING DEVICE

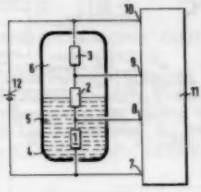
Rolf Böhme, Bad Friedrichshall; Heinz Rinderle, and Jürgen Sieber, both of Heilbronn, all of Fed. Rep. of Germany, assignors to Telefunken Electronic GmbH, Heilbronn, Fed. Rep. of Germany

Filed Apr. 15, 1982, Ser. No. 368,624

Claims priority, application Fed. Rep. of Germany, Apr. 18, 1981, 3115776

Int. Cl.³ G01F *23/24*

U.S. Cl. 73—295 15 Claims



1. A thermoelectric level measuring device for measuring the level of a material within a container which has a free space above the material comprising: three sensing resistors connected electrically in a series connection and disposed in the container, said series connection presenting a beginning, an end, and first and second connection points between said sensing resistors, with a first one of said sensing resistors being surrounded by the material, a second one of said sensing resistors being partly surrounded by the material and partly by the free space and a third one of said sensing resistors being surrounded by the free space and arranged between said first sensing resistor and said second sensing resistor of said series connection; and an evaluation circuit having inputs connected to said series connection, one at the beginning of said series connection, one to said first connection point between said sensing resistors, one to said second connection point between said sensing resistors and one at said end.

4,449,405

ROD-LIKE PROBE FOR THE CAPACITIVE MEASUREMENT OF THE LEVEL IN A CONTAINER

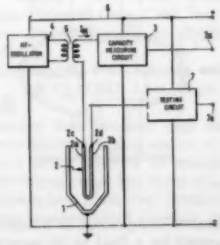
Han-Jürgen Franz, Schopfheim, and Volker Dreyer, Lörrah-Haagen, both of Fed. Rep. of Germany, assignors to Endress u. Hauser GmbH u. Co., Maulburg, Fed. Rep. of Germany

Filed Jul. 14, 1981, Ser. No. 283,209

Claims priority, application Fed. Rep. of Germany, Aug. 1, 1980, 3029352

Int. Cl.³ G01F *23/26*

U.S. Cl. 73—304 C 15 Claims



1. A capacitance level measuring arrangement for the capacitive measurement of the level in a container, said arrangement comprising:

a probe extending from the container interior to the container exterior, the probe forming one electrode and the container the other electrode of a capacitor whose capacitance depends on the level in the container, wherein the probe includes two electrical conductors insulated from each other which are electrically connected together at the ends of the conductors facing the container interior and at the ends of which remote from the container interior are provided with electrical terminals separate from each other;

means for measuring capacitance between one of said terminals on said probe and said container; and

means for testing continuity between said electrical terminals, the existence of continuity comprising an indication said probe is intact.

4,449,406

METHOD AND DEVICE FOR MEASURING THE FAT CONTENT OF MEAT

Lambertus F. W. van Haren, Druten, Netherlands, assignor to Protecon B.V., AG Oss, Netherlands

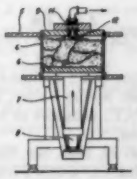
PCT No. PCT/NL81/00017, 371 Date Jan. 29, 1982, 102(e) Date Jan. 29, 1982, PCT Pub. No. WO81/03547, PCT Pub. Date Dec. 10, 1981

PCT Filed Jun. 2, 1981, Ser. No. 348,055

Claims priority, application Netherlands, Jun. 2, 1980, 8003203

Int. Cl.³ G01N *9/02*

U.S. Cl. 73—433 6 Claims



1. A method for measuring the fat content of meat by determining the specific gravity comprising the steps of first weighing a quantity of meat outside a device to compress it, the compression device comprising an upstanding cylinder open at its top with a bottom movable up and down, subsequently placing the weighted quantity of meat in, closing said cylinder from above when the meat is placed in it, compressing the weighed quantity in the closed space by moving the bottom upwardly until the meat in the cylinder is under a certain compression, and measuring the compressed volume in the compressed condition by determining the position of the movable bottom and determining the fat content from the portion of said weight to said volume, and opening the cylinder at its top after the compression and moving the movable bottom upwardly further to remove the meat from the cylinder.

4,449,407

DRIVE SHAFT MOUNTING ASSEMBLY FOR DYNAMIC WHEEL BALANCING MACHINE

Donald B. Curchod, c/o Dynabal Corporation, 151 Laura La., Palo Alto, Calif. 94303

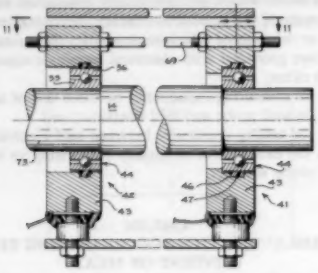
Filed Sep. 14, 1982, Ser. No. 417,849

Int. Cl.³ G01M *1/22*

U.S. Cl. 73—462 11 Claims

1. In a wheel balancing machine of the type for rotating an unbalanced wheel/tire assembly providing imbalance forces thereof, a driven shaft adapted to carry a wheel/tire assembly to rotate therewith, an elongate bearing housing, a plurality of bearing block assemblies within said housing spaced axially along said shaft and supporting said shaft for rotation, the periphery of each said assembly being spaced from the interior walls of said housing, force sensing means disposed substantially in the plane of each said assembly for generating an

electrical signal proportional to imbalance forces acting thereon, and elongate rod means extending between said bearing block assemblies, the last named means being disposed and arranged to absorb axial forces applied thereto.

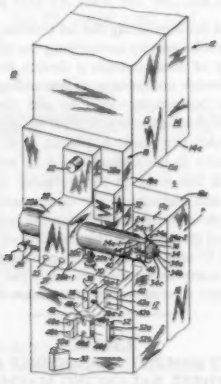


4,449,408

EMAT TEST APPARATUS HAVING RETRACTABLE PROBE

Robert A. Brooks, Rye, N.Y.; Terrance R. Banach, Danbury, Conn.; Erik Barman, Spring Valley, and Michael R. Livia, Brooklyn, both of N.Y., assignors to Magnetic Analysis Corporation, Mt. Vernon, N.Y.

Filed Apr. 22, 1982, Ser. No. 370,831
Int. Cl.³ G01N *29/04*
U.S. Cl. 73—643 **13 Claims**



1. Apparatus for electromagnetic acoustic wave examination of an object, comprising:

(a) means for generating a magnetic field;

(b) flux coupler means fixedly disposed relative to said field generating means for coupling magnetic flux therefrom;

(c) flux receiving and issuing means supported for movement relative to said flux coupler means for receiving magnetic flux therefrom in such movement and directionally issuing such received flux; and

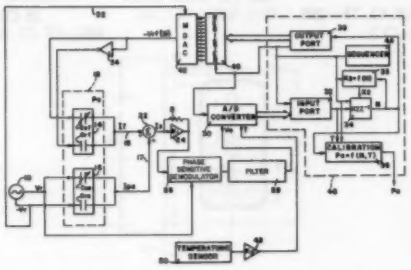
(d) transducer means for electromagnetic generation of an acoustic wave supported with said flux receiving means for movement therewith.

4,449,409

PRESSURE MEASUREMENT SYSTEM WITH A CONSTANT SETTLEMENT TIME

Frank J. Antonazzi, South Bend, Ind., assignor to The Bendix Corporation, Southfield, Mich.

Filed Jul. 13, 1981, Ser. No. 282,977
Int. Cl.³ G01L *9/12*
U.S. Cl. 73—724 **12 Claims**



1. A pressure measuring system including a pressure sensitive input impedance configuration fed by at least a first alternating reference signal, a pressure sensitive feedback impedance configuration fed by a second alternating reference signal 180° out of phase with the first alternating reference, means for differencing the outputs of the input and feedback impedance configurations to produce an error signal, means for incrementing a digital signal N at a predetermined rate while the error is non zero, and means for feeding said digital signal N to said feedback impedance configuration to generate a feedback signal to null the error signal wherein the improvement comprises:

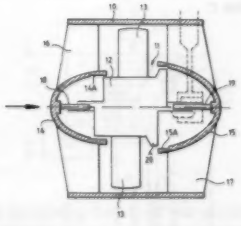
means for maintaining the time it takes for nulling the error signal substantially constant, said maintaining means having means for varying the feedback signal inversely to changes in gain generated by the measuring system.

4,449,410

AXIAL TURBINE FLOWMETERS

Roland Lett, Yerres, France, assignor to Flonic S.A., Montrouge, France

Filed Sep. 23, 1982, Ser. No. 422,504
Claims priority, application France, Sep. 30, 1981, 81 18374
Int. Cl.³ G01F *1/10*
U.S. Cl. 73—861.91 **2 Claims**



1. A fluid flowmeter comprising, in a tubular conduit intended to be traversed by a fluid to be measured, a turbine carrying blades at the periphery of a cylindrical hub and mounted for free axial rotation between two fixed fairings, one upstream and the other downstream, means for creating a zone of reduced pressure of approximately constant value beside the upstream face of the said hub, and means for providing a zone of pressure beside the downstream face of the said hub,

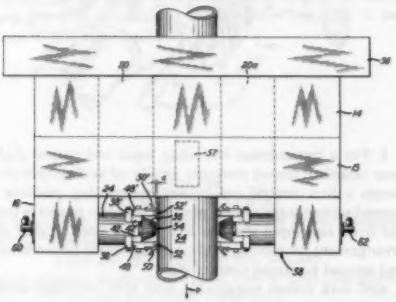
wherein the said means for providing a zone of pressure beside the downstream face of the hub comprises a combination of the relative profiles of the downstream extremity of the hub and of the downstream fairing, the profile of the hub having at this location an increased diameter, and the profile of the fairing having a hollow cylindrical portion dimensioned to allow the downstream extremity of the hub to extend into the interior of the said fairing, such that the hydrodynamic pressure on the turbine arising from the flow of fluid is continuously balanced by the difference in pressures created on either side of the hub of the turbine.

4,449,411

MAGNETIC AND ULTRASONIC OBJECTS TESTING APPARATUS

Peter J. Suhr, Westbury; Robert A. Brooks, Rye, both of N.Y., and Terrance R. Banach, Danbury, Conn., assignors to Magnetic Analysis Corporation, Mt. Vernon, N.Y.

Filed Apr. 22, 1982, Ser. No. 370,830
Int. Cl.³ G01N *29/04;* G01R *33/12*
U.S. Cl. 73—643 **15 Claims**



1. Apparatus for nondestructive object testing comprising:
(a) a source generating magnetic flux;
(b) first and second pole piece means for receiving respective portions of such generated flux and for transferring received flux therefrom;
(c) detector means responsive to flux transferred to said object by said first pole piece means for determining characteristics of said object; and
(d) electromagnetic acoustic transducer means coactive with flux transferred to said object by said second pole piece means for determining characteristics of said object.

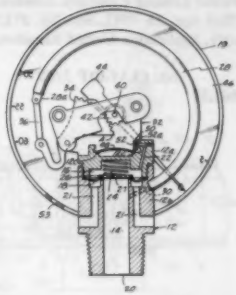
4,449,412

SAFETY PRESSURE GAGE

Merton R. Fallon, Thousand Oaks, Calif., and Thomas W. Clements, Ambler, Pa., assignors to Draft Systems, Inc., Northridge, Calif.

Filed Sep. 28, 1982, Ser. No. 425,670
Int. Cl.³ G01L *7/04, 19/06*
U.S. Cl. 73—738 **12 Claims**

1. A combination fluid pressure gage and pressure relief device for interconnection with a source of fluid under pressure, said device being adapted to measure fluid pressure within a predetermined range and being adapted to automatically vent to atmosphere upon over pressurization of the device beyond the predetermined pressure range, said device comprising:
(a) a housing having first and second chambers, said first chamber having a fluid inlet in communication with the source of fluid under pressure and said second chamber having first and second passageways adapted to communicate with atmosphere upon over pressurization of the device;
(b) a diaphragm carried by said housing normally separating said first and second chambers, said diaphragm being movable from a first position closing said first passageway of said second chamber to a second position opening said first passageway and being provided with a fluid passageway interconnecting said first and second chambers;
(c) valve means carried by said housing for normally closing said second passageway of said second chamber; and
(d) fluid pressure measuring means carried by said housing for measuring the pressure exerted by fluid within said



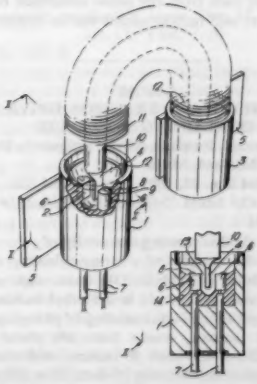
fluid inlet within a range of zero pressure to a predetermined maximum pressure, said means comprising:
(1) pressure sensing means for sensing fluid pressure within said first chamber; and
(2) operating means operably associated with said pressure sensing means for operating said valve means to open said second passageway of said second chamber to atmosphere upon the fluid pressure within said inlet exceeding the predetermined maximum pressure.

4,449,413

EXTENSOMETERS

Harold Pugh, Warrington, England, assignor to United Kingdom Atomic Energy Authority, London, England

Filed Jul. 28, 1982, Ser. No. 402,573
Claims priority, application United Kingdom, Aug. 14, 1981, 8124945
Int. Cl.³ G01B *7/22*
U.S. Cl. 73—780 **4 Claims**



1. An extensometer of the electrical capacitance kind comprising, static complementary capacitance surfaces, and a capacitance modulating member disposed between the capaci-

tance surfaces so that the modulating member is adapted for displacement relative to the capacitance surfaces in response to strain of a workpiece, characterized in that the modulating member is of arcuate form between its ends, and the extensometer is encapsulated in a flexible envelope of corresponding arcuate form.

4,449,414

FLUID-RESPONSIVE APPARATUS

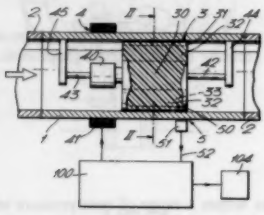
Terence J. Coates, Chiddingfold, England, assignor to Smiths Industries Public Limited Company, London, England

Filed Apr. 26, 1982, Ser. No. 371,885

Claims priority, application United Kingdom, May 21, 1981, 8115667

Int. Cl.³ G01F *1/80*

U.S. Cl. 73—861.37 **18 Claims**



1. Fluid-responsive apparatus comprising turbine means defining a passage through which fluid is to flow; means resiliently mounting said turbine means for limited angular displacement about an axis substantially parallel to the flow of fluid; drive means coupled with said turbine means for applying oscillatory drive to said turbine means about said axis such that fluid within said passage is given a component of displacement at right angles to the direction of flow through said passage; means for sensing angular displacement of said turbine means about said axis, said means for sensing said angular displacement of said sensor means including timer means for deriving an indication of the time difference between application of drive to said turbine means and angular displacement of said turbine means; computer means; and means for supplying signals to said computer means representative of torque applied by said drive means and angular displacement of said turbine means, the computer means deriving an indication of the mass flow of fluid from the phase difference between the torque applied to said turbine means and its angular displacement.

4,449,415

TRACTION FLUID AND TRACTION DRIVE SYSTEM CONTAINING SAID FLUID

Eugene D. Groenhof, Freeland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Filed Sep. 23, 1981, Ser. No. 304,726

Int. Cl.³ F16H *55/32*; C10M *1/16*, *1/54*

U.S. Cl. 74—214 **27 Claims**

1. A traction fluid consisting essentially of

(A) 30–70% by weight of a trimethylsiloxy endblocked siloxane fluid of (MeRSiO) units and, optionally, (Me_2SiO) units where Me is a methyl radical and R is selected from the group consisting of phenyl radicals and cyclohexyl radicals, where there are about 1.6 to 14 methyl radicals for each R radical, said siloxane fluid having a kinematic viscosity of about 20 to 200 centistokes at 77° F.; and

(B) 30–70% by weight of a cycloaliphatic hydrocarbon or a mixture of cycloaliphatic hydrocarbons, where said cycloaliphatic hydrocarbon contains from about 12 to 70 carbon atoms and at least one saturated ring containing at least six carbon atoms;

where components (A) and (B) of said traction fluid remain compatible and miscible when cooled to −40° F. and said traction fluid has a kinematic viscosity of less than 15,000 centistokes at −20° F.

4,449,416

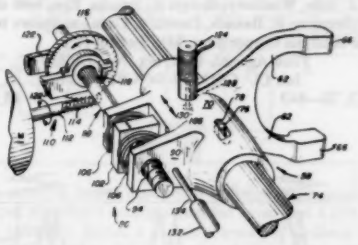
TRANSMISSION CONTROL SYSTEM

Thomas W. Huitema, Racine, Wis., assignor to J. I. Case Company, Racine, Wis.

Filed Sep. 4, 1981, Ser. No. 299,318

Int. Cl.³ F16H *5/42*; B60K *20/02*; G05G *5/10*; F16D *19/00*

U.S. Cl. 74—336 R **31 Claims**



1. For a transmission including input and output shafts and gear coupling means movable axially of said output shaft between a first neutral non-power-transmitting position and a second power-transmitting position wherein power is transmitted from said input shaft to said output shaft, a gear shifting arrangement for moving said coupling means between said first and second positions comprising:

shift fork means engageable with said coupling means and displaceable generally parallel to said output shaft for moving said coupling means axially thereof,

rotatable shaft means including a threaded portion disposed adjacent to said fork means,

motor means for selectively rotating said shaft means, and

drive means including a drive element which is displaced axially with respect to said shaft means threaded portion during rotation thereof for operatively connecting said shaft means with said fork means, whereby selective rotation of said shaft means by said motor means in one direction displaces said fork means to move said coupling means from said first position toward said second position, and rotation of said shaft means in the other direction displaces said fork to move said coupling means from said second position toward said first position.

4,449,417

CARRIER MOVING MECHANISM

Masao Sasaki, Tokyo, Japan, assignor to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Mar. 12, 1982, Ser. No. 357,725

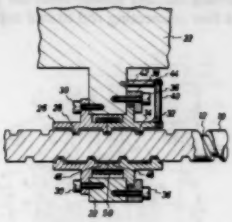
Claims priority, application Japan, Mar. 16, 1981, 56-35380[U]

Int. Cl.³ F16H *55/18*, *1/18*, *1/20*

U.S. Cl. 74—409 **4 Claims**

1. A carrier moving mechanism comprising a screw shaft, having a lead having opposite side faces, said screw shaft being rotated in a direction, first and second nuts having teeth to be engaged with the lead of the screw shaft and a carrier to which the first and second nuts are secured, wherein the teeth of the first nut are brought into contact with one side face of said opposite side faces of the lead of the screw shaft, the teeth of the second nut are brought into contact with the other side face of said opposite side faces of the lead of the screw shaft and the carrier is moved through the first and second nuts by rotation

of the screw shaft, said carrier moving mechanism being characterized in that said carrier moving mechanism further comprises a supporting mechanism which supports one of the first and second nuts on the carrier so that said nut can be rotated in the rotation direction of the screw shaft but the movement



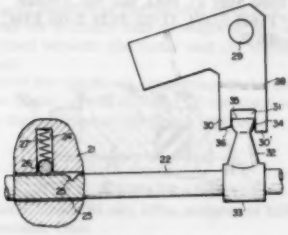
of said nut in the axial direction of the screw shaft is restricted, bias means for biasing said nut to rotate said nut in a direction to eliminate backlash and an inhibiting mechanism for inhibiting said nut from rotating in the direction opposite to said direction to eliminate backlash.

4,449,418

GEARSHIFT DEVICE

Kaoru Shori, Fuji, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Jan. 21, 1982, Ser. No. 341,265
Claims priority, application Japan, Feb. 9, 1981, 56-16956
Int. Cl.³ G05G 5/06, 9/12
U.S. Cl. 74—475 **4 Claims**



1. A gearshift device for a manually operable transmission unit having a transmission case housing gears therein, comprising:

a control rod having a center axis and movable along the center axis thereof with respect to said transmission case,

a control lever securely mounted on said control rod and having a free end portion, and

a shift fork having a pivot axis fixed with respect to said transmission case and pivotable about the pivot axis, the shift fork having one end portion bifurcated for forming a pair of protrusions and a recess between the protrusions, the free end portion of said control lever being received in the recess, the shift fork having the other end portion operably connected to the gears of said transmission unit,

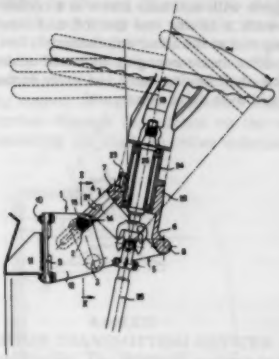
wherein the free end portion of said control lever and one of said protrusions are respectively formed with flat surfaces contactable with each other when the gears of the transmission unit are held in mesh with one another.

4,449,419

SYSTEM FOR ADJUSTING THE POSITION OF A STEERING WHEEL ON A VEHICLE

Raimon Soler Bruguera, Barcelona, Spain, assignor to Bendiberica S.A., Barcelona, Spain

Filed Jul. 15, 1981, Ser. No. 283,591
Claims priority, application Spain, Jul. 30, 1980, 494.694
Int. Cl.³ B62D 1/18
U.S. Cl. 74—493 **6 Claims**



1. A system for adjusting the position of a vehicle steering wheel comprising a rotating support for a shaft holding said steering wheel, said support being hinged to a fixed structure of the vehicle so that it is movable in a plane including the steering wheel shaft, said support comprising a four link articulated quadrilateral mechanism comprised of a base link fastened to the fixed structure of the vehicle and provided with two hinge means located at different levels, two crank links one adjustable longitudinally and the other one adjustable arcuately relative to said base link, both crank links being hinged to said base link and to a rod link supporting said shaft and locking means for locking both crank links in selected positions with respect to said base link.

4,449,420

STEERING APPARATUS

Masanao Baba, Takarazuka, Japan, assignor to Nippon Cable System Inc., Hyogo, Japan

Filed Dec. 14, 1981, Ser. No. 330,475
Claims priority, application Japan, Dec. 15, 1980, 55-177629
Int. Cl.³ F16C 1/10
U.S. Cl. 74—501 R **7 Claims**

1. In a steering apparatus comprising an operating unit and a steering unit connected together by two pull control cables to remotely control a rudder means, the improvement wherein

a. said operating unit comprises an operating-side casing;

a drive shaft having an outer surface supported in said operating-side casing and rotated by a steering wheel;

an operating main shaft having inner and outer surfaces, said inner surface being arranged on the outer surface of said driving shaft and engaged with said driving shaft;

an operating pulley having inner and outer surfaces, said inner surface being arranged on said outer surface of said operating main shaft and engaged therewith so as to be rotatable therewith and moveable axially thereon, and an engaging hole being perforated in said outer surface of said inner pulley; and

an inner cable having first and second ends and having an engaging member fixed to each of said ends, said engaging member fixed to said first end being fixed in said engaging hole;

b. said steering unit comprises a working-side casing;

a steering screw supported in said working-side casing, said

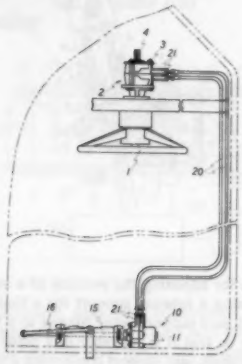
steering screw being provided with a male screw having a suitable length on one end portion, and being secured to a center gear on the other end;

a guide pipe covering said male screw so as to provide a gap therebetween, and secured to said working-side casing at one end;

a steering pipe having inner and outer surfaces inverted into the gap between said steering screw and said guide pipe so as to be moveable axially, and having a female screw engagable with said male screw at a certain region of the inner surface of one end thereof, and connected with a steering rod at the other end thereof;

an over-drive means engaging with said center gear;

a working shaft having inner and outer surfaces combined with said over-drive means; and



a working pulley having inner and outer surfaces, said inner surface being arranged on the outer surface of said working shaft so as to be moveable axially and engageable with said working shaft, and an engaging hole being perforated on the outer surface of said working pulley to engage with said engaging member fixed to said second end of said inner cable, and

c. two conduits connecting said operating unit and said steering unit, a tension-adjusting member being arranged on at least one end thereof, and inner cables inverted into each of said conduits, one end portion of each inner cable being wound round said operating pulley, the other end portion being wound round said working pulley.

4,449,421

LEVER MECHANISM WITH PROGRESSIVE TRANSMISSION

Armin Olschewski; Zoltan Laszlofalvi, and Heinrich Kunkel, all of Schweinfurt, Fed. Rep. of Germany, assignors to SKF Kugellagerfabriken GmbH, Schweinfurt, Fed. Rep. of Germany

Filed Jan. 27, 1982, Ser. No. 343,231

Claims priority, application Fed. Rep. of Germany, Feb. 7, 1981, 31042635

Int. Cl.³ G05G *1/04*

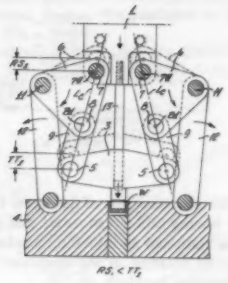
U.S. Cl. 74—516 **6 Claims**

1. A lever system for increasing the force in a press having a movable platen (3), a ram (1) operable to produce a predetermined force, and a support platen (4) for a workpiece, comprising:

a first connecting rod (12), pivotally connected at one end to said support platen (4);

a second connecting rod (9), pivotally connected at one end to said movable platen (3); and

a lever yoke (6) having three non-aligned fulcrum points (7, 8, 11) in a triangular array, pivotally connected at a first fulcrum point (7) to said ram and defining a center line between said first fulcrum point and the pivotal connection (5) between said second connecting rod and said movable platen, said yoke also being pivotally connected at a second fulcrum point (8) to said second connecting rod (9) and spaced from the pivotal connection of said second connecting rod (9) to said movable platen (3), and pivotally connected at a third fulcrum point (11) to said first connecting rod and spaced from the pivotal connection of said first connecting rod to said support platen (4),



said second fulcrum point (18) being movable across said center line in response to movement of said ram toward said support platen (4), whereby as said second fulcrum point moves across said center line and said third fulcrum point (11) moves away from said center line, the force delivered by said lever system to said movable platen increases progressively relative to the predetermined force of said ram.

4,449,422

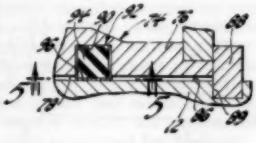
TRANSMISSION CENTER SUPPORT MOUNTING

Reece R. Fuehrer, Danville, and Richard L. Hess, Columbus, both of Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed May 17, 1982, Ser. No. 379,039

Int. Cl.³ F16H *57/04, 57/02;* F02F *5/00;* F16C *9/00*

U.S. Cl. 74—606 R **4 Claims**

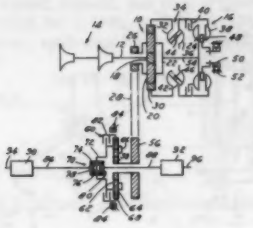


1. In a transmission having a normal elevated operating temperature and including a case having a main bore defining an internal cylindrical surface, a center support disposed in said main bore with a cylindrical outer surface thereof juxtaposed with said internal cylindrical surface, an oil supply port in said case, intersecting said internal cylindrical surface, and an oil gallery in said center support intersecting said outer surface generally in register with said oil supply port, the improvement comprising, resilient intermediate means disposed in compression between said center support member and said case operative to exert on said center support balanced and radially directed forces centralizing said center support on a longitudinal axis of said transmission, said resilient intermediate means being fabricated from a material having a coefficient of thermal expansion sufficiently exceeding at least one of the coefficients of thermal expansion of said case and said center support to maintain said intermediate means in compression and said center support centralized throughout the operating temperature range of said transmission.

4,449,423
TRACTION DRIVE AUTOMATIC TRANSMISSION FOR GAS TURBINE ENGINE DRIVELINE

Donald L. Carriere, Livonia, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Jul. 9, 1982, Ser. No. 396,550
Int. Cl.³ F16H *47/08, 37/06*
U.S. Cl. 74—688 **5 Claims**



1. A power transmission for an automotive vehicle comprising:

an input shaft;

a first planetary gearset having a first sun gear connected to the input shaft, a first ring gear, a first set of planet pinions engaging the first sun gear and the first ring gear, and a first carrier on which the planet pinion set is rotably mounted;

a traction drive unit having a first member connected to the first ring gear, a second member, and drive rollers engaging the first and second members for transmitting power therebetween, the unit being adapted to produce a continuously variable range of ratios of the speed of the second member to the speed of the first member;

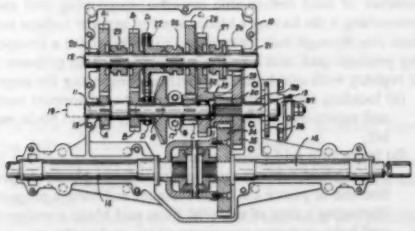
a torque converter having an impeller connected to the second member of the traction drive unit, a turbine in hydrodynamic drive relationship with the impeller connected to the first carrier and selectively connectable to the second member of the traction drive unit, and a stator mounted on a clutch that provides a one-way driving connection between the stator and the transmission casing; and

a first clutch for selectively connecting the torque converter turbine to the second member of the traction drive unit and to the impeller of the torque converter.

4,449,424
MULTI-SPEED TRANSAXLE

Hans Hauser, Chippewa Lake, Ohio, assignor to MTD Products Inc., Cleveland, Ohio

Filed Oct. 30, 1981, Ser. No. 316,564
Int. Cl.³ F16H *37/08, 57/02*
U.S. Cl. 74—701 **8 Claims**

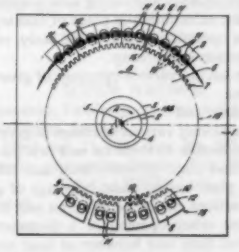


1. In a transmission having a housing for containing gears and a pair of axially aligned shafts carrying the gears, the housing having side walls and a connecting wall, the shafts having facing ends separated from each other, the improvement of a supporting member carried by a side wall of the housing a distance from the end walls of the housing, said supporting member supporting one of the shafts of said aligned shafts at a location spaced from the end of said shaft, the end of said shaft supported by the supporting member protruding from said supporting member, a gear having a centrally disposed hole carried on the end of one of the shafts of said aligned shafts, said gear being non rotatably carried by the other shaft of said aligned shafts, the said protruding end of the shaft supported by the supporting member extending into the centrally disposed hole of said gear, the arrangement providing for the bearing support of said non-supported shaft by said supporting member through dependence on the supported shaft while permitting the shafts to rotate independently of each other.

4,449,425
MOTION TRANSMITTING DEVICES

John C. Carden, Nassau, The Bahamas, assignor to Quadrant Drive BV, Leersum, Netherlands

Filed Feb. 2, 1982, Ser. No. 345,114
Claims priority, application United Kingdom, Feb. 9, 1981, 8103860
Int. Cl.³ F16H *1/28;* F18H *55/12*
U.S. Cl. 74—804 **63 Claims**



1. A motion transmitting device including eccentric means, wheel means, non-linked and non-rotatable independently movable elements adapted to engage said wheel means and movement-limiting means including a datum member with first profiles, second profiles in said independently movable elements and individual connector elements each engaging a first profile and a second profile to be held in captive dependency thereby wherein rotation of the eccentric means causes said movable elements sequentially to become engaged with a portion of the wheel means and subsequently to become disengaged therefrom, said independently movable elements being individually guided by said movement-limiting means within predetermined limits of orbital motion relative to said datum member such that one or more of said independently movable elements is/are in engagement with and stationary relative to a respective portion or portions of the wheel means, said first and second profiles constraining the independently movable elements to move into engagement with the wheel means and to remain in engagement therewith over an arc of less than a semicircle and disengaging means constraining the independently movable elements to disengage from and to remain disengaged from the wheel means over the remaining arc.

4,449,426

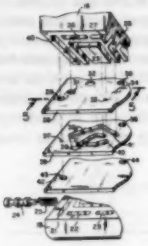
LAMINATED SEPARATOR PLATE MEANS FOR RECALIBRATING AUTOMATIC TRANSMISSIONS

Gilbert W. Younger, 2621 Merced Ave., El Monte, Calif. 91733

Continuation-in-part of Ser. No. 824,271, Aug. 15, 1977, abandoned. This application Aug. 2, 1979, Ser. No. 63,051

Int. Cl.³ F16K *1/00*; F16H *57/02*

U.S. Cl. 74—867 **3 Claims**



1. In a transmission system having a casing defining transmission oil passages to various apply units (clutch plates and clutch bands) and having a valve body with passages including shift valves interconnecting certain ones of said passages, and wherein there is provided a separator plate between said valve body and casing for routing oil between various ones of said passages to provide hydraulic oil pressure to various given ones of said apply units as a result of movement of said shift valve in response to changes in oil pressure resulting from changes in the transmission shaft speed and shaft torque to thereby automatically shift gears in said transmission, the combination of said valve body and casing with a laminated separator plate means for substitution in place of said separator plate to recalibrate the operation of said valve body, said laminated separator plate means comprising:

(a) a first plate having various openings of given dimensions and positions;

(b) a second plate; and

(c) a third plate having various openings of given dimensions and positions similar to those on said first plate sandwiching said second plate between itself and said first plate, said second plate having some openings of given dimensions and positions similar to those on said first plate and including one other opening of a diameter such as to change the oil flow rate between at least one passage in said casing and valve body whereby the time period between the start of a given shift and its completion is recalibrated to a different time by said separator plate means.

4,449,427

MACHINE FOR MACHINING CIRCULAR SAW BLADES

Ernst Beck, Maselheim; Peter Lenard, Biberach an der Riss, and Erich Pokorny, Schemmerhofen, all of Fed. Rep. of Germany, assignors to Vollmer Werke Maschinenfabrik GmbH, Fed. Rep. of Germany

Filed Dec. 16, 1981, Ser. No. 331,210

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1980, 3048738; Dec. 23, 1980, 3048739

Int. Cl.³ B23D *63/14*

U.S. Cl. 76—77 **4 Claims**

1. A machine for machining circular saw blades, including an arbor (63) for a saw blade S,

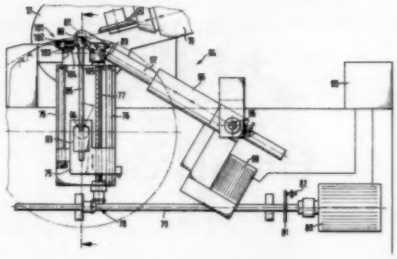
and a feed device for intermittently rotating the saw blade (S),

a guide (85) adapted to be swivelled about the axis (64) of the arbor (63) and carrying at an adjustable radial distance from said axis (64) a pawl bearing (89) to which a feed pawl (91) is mounted for engaging behind each saw tooth (Z), and further including

a swivel drive (94) for swivelling the guide (85) to and fro, wherein

the guide (85) is adapted to be shifted longitudinally in a guide slideway (83) and to be clamped by a clamping device (86),

the guide slideway (83) for the swivelling of the guide (85) is mounted to a guide carriage (75) which, for adjustment to



different saw diameters, is radially adjustable relative to the arbor (63),

the swivel drive (94) can be fixed in a position in which the guide (85) extends in the adjusting direction of the guide carriage (75),

and a holding means (101) is associated with the guide (85) for holding it in the said position while the clamping means (86) is open for adjusting the guide carriage (75).

4,449,428

METHOD OF MANUFACTURING RAZOR BLADE ASSEMBLIES

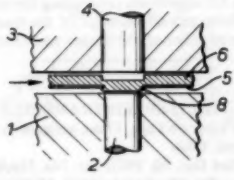
John F. Francis, Horsell Woking, England, assignor to The Gillette Company, Boston, Mass.

Filed Aug. 16, 1982, Ser. No. 408,312

Claims priority, application United Kingdom, Aug. 24, 1981, 8125748

Int. Cl.³ B21K *11/00*; B23P *11/00*; B21J *15/00*

U.S. Cl. 76—104 R **4 Claims**



1. A method of attaching a razor blade member to a support member of cold deformable material, employing tool means comprising a die having a blade member support surface and at least one through hole opening on to said surface; a co-operating pressure pad; and a punch supported by said pressure pad in registry with said hole; said method comprising the steps of:

(a) locating said blade member against said support surface and superposing said support member on said blade member;

(b) impacting said punch against said support member thus causing said support member to undergo plastic deformation and to pierce the blade member and form a projection displacing a slug of material from said blade member into said hole, said slug remaining connected to the remainder of said blade member over a minor portion of its periphery; and

(c) subjecting the said slug to impact to deform said projec-

tion to form a rivet head securing the blade member to the support member.

4,449,429

POWER TOOL FOR TENSIONING HOSE CLAMPS AND THE LIKE

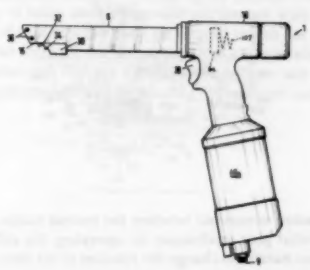
Heinz Sauer, Ronneburg; Willi Stichel, Maintal, and Gerhard Wachter, Büdingen, all of Fed. Rep. of Germany, assignors to Rasmussen GmbH, Maintal, Fed. Rep. of Germany

Filed Jul. 2, 1982, Ser. No. 394,654

Claims priority, application Fed. Rep. of Germany, Jul. 6, 1981, 3126632

Int. Cl.³ B25B *25/00*

U.S. Cl. 81—9.3 **17 Claims**



1. A tool for tensioning a hose clamp or a like device wherein a strap of flexible material defines a loop and has two end portions one of which has a laterally extending projection and wherein the exertion of a pull upon the projection entails a reduction of the size of the loop, comprising a tubular barrel provided with an inlet for insertion of the one end portion of a strap; a tensioning element reciprocably received in said barrel and having an entraining portion engageable with the projection of the inserted one end portion; a bearing interposed between said element and said barrel and reciprocable in the latter with a small amount of friction; and means for moving said element, and said bearing through the medium of said element, relative to said barrel in a direction to exert a pull upon the projection of the inserted one end portion.

4,449,430

PIPE GRIPPING TOOLS

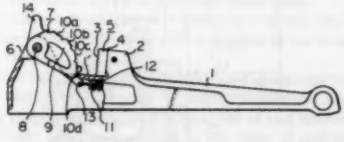
Masahiko Nakamura, and Takashi Yokoyama, both of Mie, Japan, assignors to MCC Corporation, Mie, Japan

Filed Apr. 29, 1981, Ser. No. 258,551

Claims priority, application Japan, Aug. 13, 1980, 55-111488

Int. Cl.³ B25B *13/28*

U.S. Cl. 81—98 **1 Claim**



1. A foot operated pipe gripping tool for gripping pipes having different diameters, said tool comprising:

an elongated body having a base portion for supporting said body on a support surface, said body having forward and rear ends;

a fixed jaw extending upwardly from said body at a position intermediate between said forward and rear ends thereof, said fixed jaw having a bite face directed toward said forward end of said body;

a movable jaw pivoted to said forward end of said body by means of a pivot pin, said movable jaw having a plurality of distanct and separate bite faces spaced from each other along an edge of said movable jaw defined in a generally vertically extending plane and directed generally toward said bite face of said fixed jaw, said bite faces of said movable jaw being spaced at different distances from said bite face of said fixed jaw, thereby for gripping pipes of different diameter in cooperation with said bite face of said fixed jaw;

said fixed jaw and said movable jaw defining therebetween a generally upwardly directed space for the insertion in a generally downward direction of a pipe to be gripped;

return spring means, connected at a first end thereof to said movable jaw and at a second end thereof to said body, for urging said movable jaw to pivot about the axis of said pivot pin in a first generally upwardly direction toward said fixed jaw into a pipe gripping position;

projection means, extending generally upwardly from said movable jaw, for enabling manual operation for pivoting said movable jaw about said axis of said pivot pin in a second generally downward direction against the force of said spring means away from said fixed jaw to a pipe release position;

each said bite face of said movable jaw comprising a plurality of saw teeth constructed such that the distance between said axis of said pivot pin and the crest of each said tooth is a maximum at the lowermost said tooth, such distance decreases successively upwardly tooth-by-tooth, and such distance is a minimum at the uppermost said tooth; and

said bite faces of said movable jaw being constructed such that the pitch between adjacent said teeth is a maximum at the uppermost said bite face, and the pitch between adjacent said teeth decreases successively downwardly bite face-by-bite face toward the lowermost said bite face.

4,449,431

SCREW WRENCH

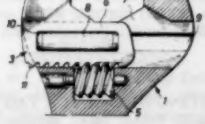
Bengt B. Brunosson, Enköping, Sweden, assignor to AB Bahco Verktyg, Enköping, Sweden

Filed Jan. 27, 1982, Ser. No. 343,312

Claims priority, application Sweden, Feb. 20, 1981, 8101151

Int. Cl.³ B25B *13/16*

U.S. Cl. 81—165 **5 Claims**



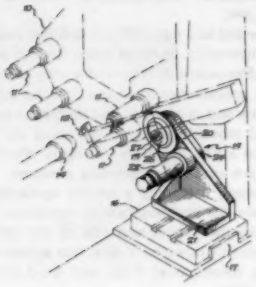
1. An adjustable spanner or screw wrench including a head having a fixed jaw, which is arranged on a slide glidably accommodated in the wrench head, said slide being adjustable in optional position by means of an adjusting means, the slide having a web in the form of a substantially planar plate running in a slot in the wrench head, there being a rod in engagement with grooves in the side walls of the slot for retaining the slide in the slot, characterized in that the rod constitutes a separate body, which is inserted in an elongate opening in the slide web, said opening having its longitudinal axis in the direction of travel of the slide and substantially parallel to the longitudinal axis of said rod, there being play between the opening and the rod, allowing the rod to move laterally in the slide web, said rod being longitudinally movable together with said slide.

4,449,432

CUTOFF DEVICE FOR AUTOMATIC SCREW MACHINE

James R. Smith, Orchard Park, N.Y., assignor to Curtis Screw Company, Inc., Buffalo, N.Y.

Filed Sep. 21, 1981, Ser. No. 304,025
Int. Cl.³ B23B *3/34;* B23D *23/00*
U.S. Cl. 82—3 **5 Claims**



1. A rotary saw cutoff device for cutting workpieces, said device being usable with an automatic screw machine wherein a plurality of metal cutting operations are performed on bar stock sections which are advanced in a circular path to a plurality of work stations for sequential presentation to a plurality of cutting tools; said cutoff device comprising:

a base (**21**) positionable on a machine slide (**17**) for transverse movement towards and away from the bar stock;

an upstanding frame (**20**) which extends generally transversely to the axis of said circular path and having spaced apart first and second portions, the first portion being supported by said base (**21**) and the second portion being disposed adjacent said circular path;

rotatable means (**27, 26, 15, 13 and 28**) extending through the second portion of said frame (**20**) and including a rotatable saw (**13**) secured thereto and mounted on one side of said frame (**20**) and a driven element (**28**) disposed on the other side of said frame;

drive means including a motor (**22**) secured to said one side of said frame (**20**) between the first and second portions of said frame and a drive element (**37**) rotatably driven by said motor (**22**) and disposed on said other side of said frame (**20**), said drive element (**37**) being interconnected with said driven element (**28**) for driving the same;

a cover (**24**) secured to said other side of said frame (**20**) and enclosing said drive and driven elements (**37, 28**); and

bearing means (**30, 29**) disposed within said frame (**20**) and cover (**24**) for rotatably journaling said rotatable means.

4,449,433

CUTTING DEVICE FOR TAG WEB

Takehiko Miyamoto, Tokyo, Japan, assignor to Kabushiki Kaisha Sato, Japan

Filed Feb. 23, 1982, Ser. No. 351,459
Claims priority, application Japan, Feb. 23, 1981, 56-24234
Int. Cl.³ B26D *5/20*
U.S. Cl. 83—76 **13 Claims**

1. A cutting device for cutting tags, or the like, from a continuous web thereof, the device comprising:

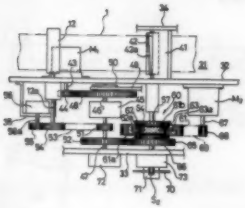
means for feeding a tag web along a path;

a rotary blade positioned at a fixed location along the path and being rotatable about a rotary axis, and including a cutting blade projecting outwardly thereof and extending generally axially thereof, the cutting blade being placed for engaging the web as the rotary blade rotates past the web, and the cutting blade being for severing the web as the blade engages the web;

a first motor for continuously rotating the rotary blade about its axis; a first power transmission mechanism connected to the first motor for transmitting the rotation of the first motor;

a differential gear mechanism connected between the first power transmission mechanism and the rotary blade for rotating the rotary blade when the differential gear mechanism is operated through the first power transmission mechanism;

timing control means for adjusting the rotation of the rotary blade, thereby to correct the cutting timing; the timing control means including a second motor operable independently of the first motor, a second power transmission



mechanism connected between the second motor and the differential gear mechanism for operating the differential gear mechanism to change the rotation of the rotary blade; and

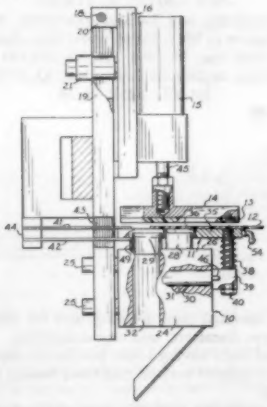
reference position means including tag positioning means for positioning the tag web at a reference position thereof, and a rotary blade positioning means for positioning the rotary blade at a respective reference position thereof, the tag positioning means including a limit switch for detecting whether the tag web is in its reference position, and the rotary blade positioning means comprising a brake for braking the rotary blade when it is controlled.

4,449,434

HOLE PUNCHING APPARATUS FOR THERMOPLASTIC FILM

James R. Johnson, 3819 Greenhill Dr., Chamblee, Ga. 30341

Filed Apr. 12, 1982, Ser. No. 367,690
Int. Cl.³ B26D *7/10, 7/18;* B26F *1/12*
U.S. Cl. 83—98 **5 Claims**



1. Apparatus for punching holes and the like in thermoplastic film comprising a steel rule die having an upwardly facing cutting edge, die heating means for heating said die, a platen

above said die for selective engagement with said die, and means for moving said platen towards said die, said die heating means including a die block for carrying said die, and heating means for heating said die block, said die defining an opening therein to receive scrap cut from thermoplastic film, said die block defining an opening therein for allowing said scrap to pass through said die block, said die block and said die being heated to a temperature above the melting temperature of said scrap, a stripper between said die and said platen, said stripper defining an opening therein sufficient to receive said die therethrough, spring means for biasing said stripper to a position above said die block, the arrangement being such that said thermoplastic film normally lies along the upper surface of said stripper and said film is moved into contact with said die by said platen, said stripper defining an air passage therein and a plurality of holes connecting said air passage with said upper surface of said stripper, and air supply means for selectively passing air through said air passage, out said plurality of holes, and against said film for lifting said film from said upper surface of said stripper and for cooling said stripper and said film.

4,449,435

APPARATUS FOR BUNCHING AND SEVERING WIRE COILS

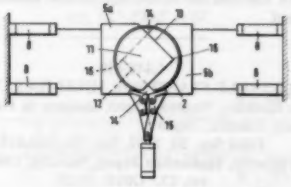
Werner Colditz, Duisburg, Fed. Rep. of Germany, assignor to Mannesmann Aktiengesellschaft, Dusseldorf, Fed. Rep. of Germany

Filed Apr. 12, 1982, Ser. No. 367,773

Claims priority, application Fed. Rep. of Germany, Apr. 23, 1981, 3116089

Int. Cl.³ B21F *11/00*

U.S. Cl. 83—167 **2 Claims**



1. An apparatus for severing strands of continuous wire coils to create individual wire coil bunches, comprising:

(a) a cylindrically-shaped wall defining a vertical shaft;

(b) a wire bunch collecting station located at the bottom of said shaft;

(c) a wire bunch collecting shelf located above said bottom, said shelf comprising two opposed, symmetrical and similarly shaped edge defined halves, one of said halves being vertically offset with respect to the other of said halves;

(d) said halves being selectively reciprocable into said shaft from a first fully retracted position to a second projected position, said second projected position causing said halves to overlap one another and substantially cover the cross section of said shaft, the uncovered section of said cross section of said shaft defining two wire strand cutting areas; and

(e) a pair of cutting shears located at the same level, in said shaft, as said shelf, one of said pair being located at each of said cutting areas.

4,449,436

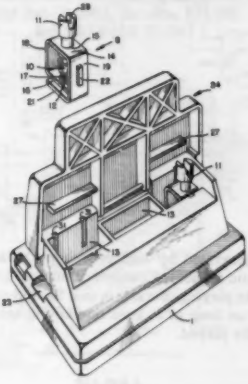
SHEET PUNCH DEVICE

Joseph K. Semerjian, Franklin Park, and Glenn R. Lodge, Mt. Prospect, both of Ill., assignors to Wilson Jones Company, Chicago, Ill.

Filed Mar. 12, 1982, Ser. No. 357,736

Int. Cl.³ B26F *1/02*

U.S. Cl. 83—571 **4 Claims**



1. A sheet punch device comprising

(a) a base;

(b) a housing supported on and spaced from the base to provide an opening for receiving sheets to be punched;

(c) a plurality of elongated punch dies with axes generally vertically oriented mounted in portable die mounts;

(d) at least one walled elongated recess in the housing having walls which walls include first alignment means generally extending a distance substantially parallel to the axes of the punch dies for positioning the die mounts in the recess;

(e) complementary alignment means on the portable mounts for engaging said recess alignment means when one or more portable die mounts are placed in the recess;

(f) the first alignment means and complementary alignment means being sized and shaped such that each die punch is aligned when and as it is placed in the recess; and

(g) lever means mounted on the housing for movement toward and away from the dies such that when moved toward the dies it engages with the dies as mounted in the elongated recess to drive the dies through the sheets.

4,449,437

AUTOMATIC PIANO

Robert B. Cotton, Jr., Erlanger, Ky., and Dale M. Uetrecht, Colerain Township, Hamilton County, Ohio, assignors to Baldwin Piano & Organ Company, Cincinnati, Ohio

Filed Sep. 21, 1981, Ser. No. 304,404

Int. Cl.³ G10H *1/38, 1/46, 7/00*

U.S. Cl. 84—1.01 **47 Claims**

41. In an electronic musical instrument having an array of playing keys, each of which by its playing action initiates the onset of a corresponding musical tone and which by the power of its playing action controls the volume of the corresponding musical tone, apparatus connected to the keys of a limited range of said array for generating an automatic sequential pattern of musical notes, said apparatus comprising:

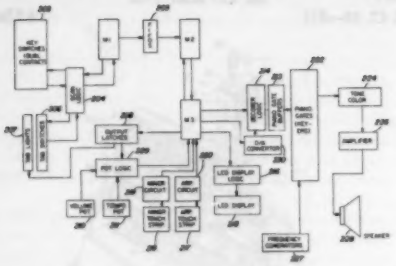
memory means for providing fixed, stored data corresponding to the notes of an automatic sequential pattern;

key detecting means for sensing the playing of a key within said limited range;

processing means for generating notes from the data in said memory means, the notes being a function of a key being

manually played within said limited range as sensed by said key detecting means; and

audio output for generating and sounding, while at least one key is being manually played within said limited range, the tones of said automatic sequential pattern according to the



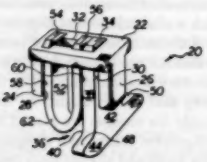
notes generated by said processing means, whereby an automatic sequential pattern of musical tones commences upon the playing of a key in said limited range and continues for so long as at least one key in said range is being manually played.

4,449,438

MUTE FOR STRINGED INSTRUMENTS

Richard Goldner, 3717 Toad Lake Rd., Bellingham, Wash. 98225

Filed Sep. 13, 1982, Ser. No. 416,984
Int. Cl.³ G10D *3/04*
U.S. Cl. 84—310 **10 Claims**



1. A device for muting the sound produced by a stringed instrument having a bridge member and a tall piece comprising:

a holder;

a first engaging surface for engaging a first major surface of said bridge member;

a second engaging surface for engaging a second major surface of said bridge member;

means for mounting said first and second engaging surfaces to said holder in a generally facing, movable and pivotable relation one to another; and

means mounted to said holder for biasing said first and second engaging surfaces toward one another with a force sufficient to retain said device on said bridge member and adapt the orientation of said first and second engaging surfaces to the orientation of said first and second major surfaces of said bridge member, respectively.

4,449,439

MOUTHPIECE FOR WOODWIND INSTRUMENTS

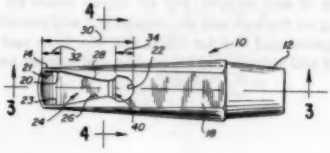
Frank E. Wells, 14514 Wallace Ave., Riverdale, Ill. 60627

Filed Sep. 28, 1982, Ser. No. 425,720
Int. Cl.³ G10D *9/02*
U.S. Cl. 84—383 R **5 Claims**

1. An improved mouthpiece for a woodwind instrument of the type which generally includes a collar end for engaging an instrument neck at one end and a mouth engaging portion at the opposed end thereof extending from the tip end of the mouthpiece inwardly for a distance in the direction of the opposed collar end, the mouth engaging portion having an upper inclined surface along the top portion thereof and a horizontally flattened surface along the lower portion thereof, and a wind channel traversing the entire length of said mouthpiece, the improvement comprising in combination,

a slotted cut-out section bounded by opposed side edges formed in said horizontally flattened surface along the lower portion thereof,

said slotted cut-out section extending from the tip end of said mouthpiece inwardly for a distance in the direction of said collar end of said mouthpiece and terminating in a circular inner end,



said slotted cut-out section having a key-slot configuration formed by a pair of opposed curvilinear flanges extending inwardly from the opposed side edges thereof for a portion of the distance between said tip end and said circular inner end thereof,

said curvilinear flanges having a thickness which is less than the diameter of said wind channel thereby to create a wind compression chamber formed in said wind channel and extending for a distance along the length of said wind channel,

whereby said wind compression chamber formed by said opposed curvilinear flanges formed in said slotted cut-out section will operate to create back pressure and have the effect of smoothing out the vibrational rate of the air as it enters the instrument thereby to improve the tonal qualities of the instrument throughout the entire tonal range thereof.

4,449,440

ADJUSTABLE STAND FOR HIGH-HAT CYMBAL

Yoshihiro Hoshino, Nagoya, Japan, assignor to Hoshino Gakki Company, Limited, Japan

Filed Sep. 30, 1982, Ser. No. 431,018
Claims priority, application Japan, Nov. 30, 1981, 56-178346
Int. Cl.³ G01D *13/00*
U.S. Cl. 84—422 R **12 Claims**

1. A high-hat cymbal stand, comprising:

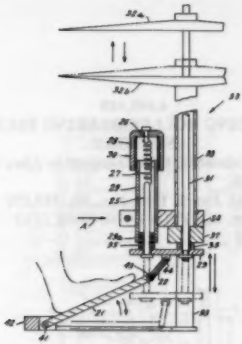
a pedal movable between an upraised, start position and a lowered position; a cymbal moving rod connected with the pedal for being movable lengthwise by movement of the pedal between its positions; a first cymbal attached to the rod for being moved by the rod as the rod moves lengthwise; a second cymbal held in position on the stand for being struck by the first cymbal as the first cymbal is moved by the pedal being moved to the lowered position of the pedal;

a spring connected with the pedal for returning the pedal to the start position and for correspondingly moving the pedal, the rod and the first cymbal together; and

a pedal height adjusting device for adjusting the height of the pedal at the start position thereof, for varying the distance over which the pedal moves from the start to the lowered positions; the pedal height adjusting device comprising:

the stand including a holder fixed against movement as the pedal moves; a spring container for being secured to the

holder and for containing the spring within it; clamping means for clamping the spring container to the holder at an adjustable, selected height with respect to the lowered position of the pedal; the spring container including a bottom which moves together with the spring container and the bottom being positioned for being engaged by the pedal at the start position of the pedal, whereby adjustment of the height of the spring container on the holder correspondingly adjusts the height of the bottom of the spring container and adjusts the start position of the pedal in engagement with the bottom of the spring container, and the spring in the container is readjusted in its height along with the spring container without readjustment of the spring force of the spring.

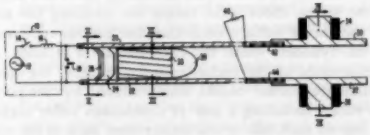


4,449,441

ELECTROMAGNETIC PROJECTILE LAUNCHER WITH MAGNETIC SPIN STABILIZATION

Dan R. McAllister, Sunnyvale, Calif., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 9, 1982, Ser. No. 356,587
Int. Cl.³ F41F *1/02*
U.S. Cl. 89—8 **11 Claims**



1. A parallel rail electromagnetic projectile launcher comprising:

a first conductive rail having an arcuate surface;

a second conductive rail having an arcuate surface and being disposed parallel to said first conductive rail, to form a cylindrical bore between said rails, wherein the arcuate surfaces of said rails define a portion of the perimeter of said bore;

a source of high current;

means for commutating said current to said rails;

means for conducting current between said rails and for propelling a cylindrical projectile along said bore;

means for generating a magnetic flux field through which said projectile passes during a launch, wherein said magnetic flux field is distinct from electromagnetic fields produced by current flowing through said rails which are used to propel said projectile; and

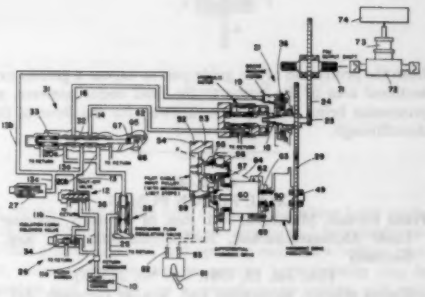
means for imparting electromagnetically induced spin to said projectile in response to the passing of said projectile through said magnetic flux field.

4,449,442

HYDRAULIC VALVE CONTROL AND FEEDBACK UTILIZING A HARMONIC DRIVE DIFFERENTIAL

Steven J. Ebbing, and Robert J. Hermans, both of Rockford, Ill., assignors to Sundstrand Corporation, Rockford, Ill.

Filed Jan. 5, 1982, Ser. No. 337,193
Int. Cl.³ F15B *15/26*
U.S. Cl. 91—44 **14 Claims**



1. A motor control means and feedback arrangement to minimize the effects of backlash in a rotary output system, said system comprising:

a source of energy,

said motor control means having means moveable from a null position, said motor control means coupled to said source of energy and to a motor which in turn is coupled to said rotary output and to a second input of a differential harmonic drive that has first and second inputs and an output, said first input coupled to a rotational command input means and said output drivingly coupled to said moveable means in response to a given rotational command input when said second input is in an initial static position, whereupon said motor is coupled to said source of energy through said motor control means and said rotary output is driven a precise number of revolutions dependent upon said given rotational command input, said second input being simultaneously driven a given number of revolutions in a direction to provide feedback such that said differential harmonic drive output moves to return said moveable means to said null condition and said system is then in a condition to respond to an additional rotational command input.

4,449,443

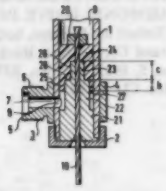
CYLINDER/PISTON DRIVE, ESPECIALLY FOR RETIGHTENER SYSTEMS IN AUTOMATIC SAFETY BELT WINDING DEVICES

Artur Föhl, Schorndorf, Fed. Rep. of Germany, assignor to REPA Feinstanzwerk GmbH, Alfdorf, Fed. Rep. of Germany

Filed Oct. 2, 1981, Ser. No. 307,883
Claims priority, application Fed. Rep. of Germany, Oct. 6, 1980, 3037707; Sep. 18, 1981, 3137263
Int. Cl.³ F15B *15/20*; F01B *9/00*
U.S. Cl. 91—392 **5 Claims**

1. Cylinder/piston drive especially for retightening systems in automatic safety belt winding devices, comprising a cylinder, a movable drive piston in the cylinder, said piston being free of passageways for the flow of fluid therethrough, a pressure accumulator from which fluid under pressure will be released adapted to be connected to the interior of the cylinder, an opening in the cylinder wall for flow of fluid under pressure from the pressure accumulator through said opening into the interior of the cylinder, a guide part in the cylinder

formed of a base with a protrusion which extends from the base into the piston to initially reduce the cross sectional area of the piston exposed at an end face to the fluid under pressure and upon movement of the piston and withdrawal of the piston



from the protrusion of the guide part to expose a greater cross sectional area of the piston to the fluid under pressure, said protrusion being free of a passageway for the flow of fluid therethrough.

4,449,444

AXIAL PISTON PUMPS

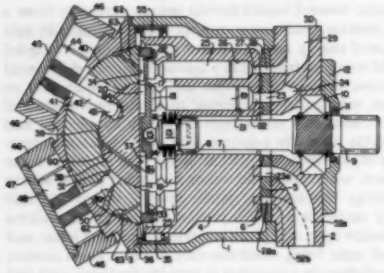
Franz Forster, Muhlbach, Fed. Rep. of Germany, assignor to Linde Aktiengesellschaft, Hollriegelskreuth, Fed. Rep. of Germany

Filed Jul. 13, 1981, Ser. No. 282,757

Claims priority, application Fed. Rep. of Germany, Jul. 15, 1980, 3026765

Int. Cl.³ F01B *13/04*; F04B *1/26*

U.S. Cl. 91—506 **7 Claims**



1. An axial piston pump for producing two streams that can be regulated independently of each other with respect to size and pressure comprising a housing, a revolving cylindrical drum in said housing, a drive shaft connected to said drum for rotating the same, a plurality of spaced holes in said drum on two different pitch diameters generally parallel to the drum axis and opening to a common end face of said drum, a plurality of pistons reciprocable in said holes, a rotary slide control valve acting on the opposite end face of said drum, a first tapered washer bearing on one end of said pistons moving in the holes of the smaller pitch diameter, a second tapered washer surrounding the first tapered washer and bearing on one end of the pistons moving in the holes of larger pitch diameter, means engaging said first and second tapered washers independently to move them relatively to one another at an angle to the axis of the drum and a pair of separate outlet ports on said rotary valve receiving fluid independently from each of the pistons of different pitch diameter and delivering the same from the pump, said control rotary slide valve having a first generally semi-circular channel at least on the discharge side communicating with the piston and holes located on the smaller pitch diameter and a second separate generally semi-circular channel communicating with the pistons and holes located on the larger pitch diameter and two separate discharge lines, one connected to each of said channels, said two tapered washer bodies being of generally hemispherical shape, the one of smaller pitch diameter rotatably received in a hemispherical recess of the one of larger pitch diameter.

4,449,445

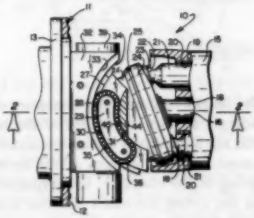
RECIRCULATING ROLLER BEARING ROCKER CAM SUPPORT

Alan H. Viles, Columbus, Ohio, assignor to Abex Corporation, Stamford, Conn.

Filed Jun. 1, 1982, Ser. No. 383,678

Int. Cl.³ F01B *13/04*; F04B *1/30*

U.S. Cl. 92—12.2 **1 Claim**



1. A variable displacement fluid energy translating device having a housing, a barrel rotatably supported in the housing, a plurality of cylinders formed in the barrel and aligned parallel with the axis of rotation thereof, a piston mounted for reciprocation in each cylinder, a shoe connected to the end of a piston projecting from each cylinder, a rocker cradle, an arcuate surface formed on the rocker cradle, a rocker cam, means for pivotally supporting the rocker cam on the arcuate surface for movement about an axis perpendicular to the axis of rotation of the barrel, a flat thrust surface on the rocker cam on which the piston shoes slide, means for retaining the shoes against the thrust surface such that the pistons reciprocate within the cylinders when the cam surface is inclined, and means connected to the rocker cam for pivoting the rocker cam within the rocker cradle, characterized by the pivotal support means including a pair of continuous roller surfaces formed one on each side of the rocker cam, each of the roller surfaces having a first convex arcuate portion complementary to and adjcent the arcuate surface formed on the rocker cradle, a second concave arcuate portion parallel to and spaced from the first arcuate portion and a pair of rounded end surfaces which connect each end of the first and second parallel surfaces, a pair of roller complements which engage and circulate on each of the roller surfaces, wherein the rollers in the roller complements which engage the complementary first convex arcuate portion of the roller surfaces simultaneously engage the arcuate surface of the roller cradle to provide a roller bearing support for the rocker cam on the rocker cradle, means for retaining the roller complements in engagement with the roller surfaces, and means for holding the rocker cam and rollers in the roller complements against the rocker cradle, including a holddown plate having an inner surface which is complementary to and adjacent the second concave arcuate portion of the roller surface and engages the roller complement as it circulates between the inner holddown plate surface and the second concave arcuate portion of the roller surface.

4,449,446

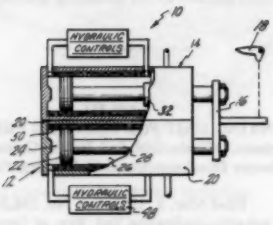
BALLISTICALLY TOLERANT CONTROL SYSTEM

William G. Degnan, Huntington, Conn., and John D. Fansler, Street, Md., assignors to United Technologies Corporation, Hartford, Conn.

Continuation-in-part of Ser. No. 73,833, Sep. 10, 1979, abandoned. This application Aug. 28, 1981, Ser. No. 297,482

Int. Cl.³ F01B *1/00*; F16J *15/18, 11/04*

U.S. Cl. 92—146 2 Claims



1. A control including:

(1) a cylinder-piston assembly comprising:

a. a cylinder having a bore portion,

b. a piston positioned in said cylinder bore for reciprocation therewithin and defining a pressure chamber on at least one side thereof within said bore,

c. a piston rod extending from said piston longitudinally along said bore and terminating at a station external thereof,

d. a fixed wall member supported from said cylinder and having an aperture enveloping said piston rod and constituting the structural end wall of said pressure chamber,

e. a laminated, frangible, anisotropic cylindrical sleeve fabricated of a plurality of superposed layers of wound and plastic bonded high tensile strength filament, and with the filaments of each layer being substantially parallel to each other and extending in a direction substantially different from the filament of at least one of the other layers so that each layer and hence said sleeve is anisotropic, and wherein said sleeve is bonded to said cylinder bore and extends substantially the full length thereof and envelops said piston, and wherein said sleeve has a thin, brittle, wear-resistant inner nickel plated surface on the inner diameter of the sleeve to present a wear-resistant contact surface in sealing engagement with said piston and being of selected wall thickness and frangibility so that when said cylinder is subjected to sharp impact, the cylinder will deform and the sleeve with said inner surface will disintegrate locally in the vicinity of the sharp impact and cylinder deformation, and the piston will be able to reciprocate within the cylinder with the sleeve so disintegrated,

(2) means to control the flow of pressurized fluid to said pressure chamber to cause said piston to move within said cylinder during normal operation, and

(3) a fluid actuator means operatively connected to said cylinder-piston assembly to cause said piston to reciprocate within said cylinder when cylinder is so deformed and said sleeve so disintegrated due to sharp impact.

4,449,447

BRAKE PISTON OF DISK TYPE

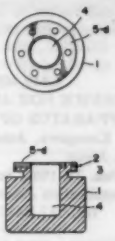
Kouichiro Yanagi, Hanyu, Japan, assignor to Akebono Brake Industry Company, Ltd., Tokyo, Japan

Filed May 13, 1981, Ser. No. 263,054

Claims priority, application Japan, May 20, 1980, 55-66671

Int. Cl.³ F16J *1/00*

U.S. Cl. 92—248 1 Claim



1. Brake piston of disk type comprising a piston body made of resinous material and having an opening end, a circumferential seal groove adjacent said opening end, and a hollow interior, characterized in that an annular heat resisting ring is joined to said opening end by simultaneous casting, said ring has a plurality of perforations extending axially of the piston body, said opening end has formed thereon by said simultaneous casting a plurality of protrusions filling said perforations, and said ring is made of a material selected from the group consisting of a ceramic, a sintered alloy, steel, and woven carbon fiber.

4,449,448

DOUBLE BAND PRESS

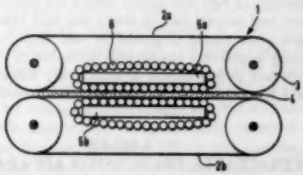
Gerhard Stäbler, Murr, and Konrad Schermutzki, Remseck, both of Fed. Rep. of Germany, assignors to Santrade Ltd., Luzern, Switzerland

Filed Sep. 22, 1982, Ser. No. 421,061

Claims priority, application Fed. Rep. of Germany, Oct. 13, 1981, 3140548

Int. Cl.³ B30B *3/00*

U.S. Cl. 100—153 17 Claims



1. A double band press comprising:

a pair of endless metal bands arranged such that a working flight of each band travels opposite a working flight of the other band to press material therebetween,

a pair of pressure plates, each positioned adjacent respective ones of said working flights,

a pair of pressure roller assemblies positioned adjacent respective ones of said pressure plates, each pressure roller assembly comprising:

a plurality of pressure rollers arranged to travel between one of said pressure plates and its respective metal band to transmit pressure from the former to the latter, the axes of said pressure rollers being oriented perpendicular to the direction of band travel, and

a pair of guide chains disposed on opposite sides of the respective pressure rollers and connected to respective ends of each of said presure rollers, each guide chain comprising a plurality of links interconnected in series by means of pins,

at least some of said links being connected to said ends of said pressure rollers at locations offset from said fasteners in a direction generally transverse to the plane of the working flight of the associated band, the ratio of the quantity of said rollers to the quantity of said pins in each chain being greater than 1:1.

4,449,449

DATA STAMP DEVICE FOR AUTOMATIC PRINTING APPARATUS OF COPIER

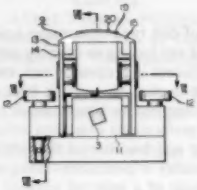
Yutaka Watanabe, Kanagawa, Japan, assignor to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Jun. 21, 1982, Ser. No. 390,603

Claims priority, application Japan, Aug. 5, 1981, 56-121798

Int. Cl.³ B41J *1/60*

U.S. Cl. 101—111 **14 Claims**



1. A data stamp device for an automatic printing apparatus of a copier, comprising:

a data stamp unit having an opening on a surface thereof;

at least one endless belt having a plurality of seals thereon;

means for mounting and driving said at least one endless belt within said unit so that a desired seal projects out of said opening;

means for swiveling said data stamp unit so that said desired seal comes in contact with a sheet, said swiveling means including;

a first swivel shaft about which said data stamp unit swivels;

a second swivel shaft coupled to a driving system which moves said sheet through said copier;

an idler shaft;

a plurality of belt and pulley means for interconnecting said first and second swivel shafts and said idler shaft; and

clutch plate means disposed on said first swivel shaft and being selectively engageable with one of said plurality of belt and pulley means to selectively transmit rotation of said second swivel shaft to said first swivel shaft.

4,449,450

RETRACTABLE PROPULSION APPARATUS FOR CARDBOARD BOX PRINTING MACHINE

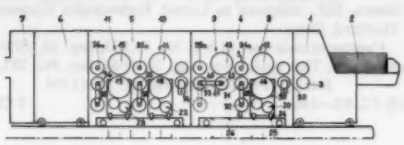
Jean-Jacques Barny, Villefranche, and Bernard Capdeboscq, St. Just Chaleyssim, both of France, assignors to S.A. Martin, Villeurbanne, France

Filed Jul. 28, 1982, Ser. No. 402,677

Int. Cl.³ B41F *5/06, 21/00, 13/34*

U.S. Cl. 101—232 **1 Claim**

1. Cardboard forming and printing machine, comprising printing modules equipped with means enabling lateral translation of a block-holder cylinder assembly comprising at least a block-holder cylinder, said machine comprising in addition a retractable propulsion device for cardboard positionable when said block-holder cylinder is retracted laterally so as to continue to assure the propelling function of the cardboard that the latter assured before its lateral translation, said propulsion device being positioned at the end of at least one oscillating lever having its axis of rotation coaxial with that of the lower propulsion device which follows the printer module associated with said block-holder cylinder and at a distance from said axis



equal to the longitudinal component of the distance separating said axis from the axis of the preceding printing roll.

4,449,451

INKING UNIT FOR PRINTING PRESSES

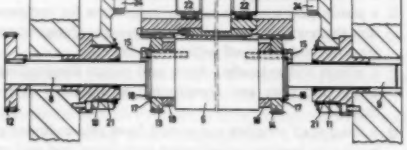
Rudi Junghans, Wilhelmsfeld, Fed. Rep. of Germany, assignor to Heidelberger Druckmaschinen, Heidelberg, Fed. Rep. of Germany

Filed Mar. 9, 1982, Ser. No. 356,311

Claims priority, application Fed. Rep. of Germany, Mar. 13, 1981, 3109584

Int. Cl.³ B41F *31/14, 31/26;* **B41L** *27/28*

U.S. Cl. 101—350 **7 Claims**

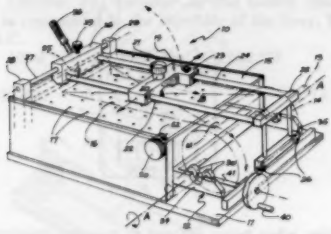


1. In an inking unit for a printing press having an ink duct with an ink-duct roller revolvable at a given speed therein, a transfer roller in rolling contact with the ink-duct roller, the transfer roller having an outer cylindrical surface formed with a plurality of helical ridges thereon, a distributor roller, and means for revolving the distributor roller at press speed greater than the given speed of the ink-duct roller, the transfer roller being rollable on the distributor roller for transporting ink film from the ink-duct roller farther into the inking unit, the improvement therein comprising mutually meshing gear means carried by the transfer roller and the distributor roller, the transfer roller being drivable by the distributor roller via said gear means, and means for applying yielding contact pressure of such magnitude between the transfer roller and the distributor roller during rolling of the transfer roller on the distributor roller that there is continuous contact between the surface of the distributor roller and the surface of the transfer roller located between the ridges, the ridges being in relatively low-pressure contact with the ink-duct roller revolving more slowly than the distributor roller, the ridges are bordered by recesses formed in the outer cylindrical surface of the transfer roller and defined by a cylindrical base coaxial with the outer cylindrical surface and only slightly deeper than the outer cylindrical surface, the helical ridges being formed by surface portions of the transfer roller extending from said cylindrical base with a slight inclination from opposite sides towards an apex, the ridges being narrow compared to the width of the recesses therebetween.

4,449,452
RAPID PLATE MOUNTER

George B. Mansell, Cremorne, Australia, assignor to Rapid Packaging Services Pty. Ltd., New South Wales, Australia

Filed May 23, 1983, Ser. No. 496,860
Claims priority, application Australia, May 28, 1982, PF4202
Int. Cl.³ B41F 27/00
U.S. Cl. 101—382 MV 11 Claims

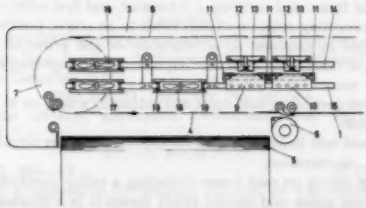


1. A printing plate mounting device including,
a frame;
a print cylinder support, mounted on the frame so as to locate the longitudinal axis of a print cylinder at a predetermined location;
a printing plate receiving surface located on the frame enabling transfer of a printing plate on the surface to said cylinder;
location means to aid in the location of the printing plate on said surface for correct alignment with said cylinder, said location means comprising an optical magnifier movably supported on said frame so as to be locatable at two spaced locations defining a line normal to said longitudinal axis, said magnifier having optical alignment markings so that a user can position the plate on said surface by alignment with said markings when at said locations.

4,449,453
DEVICE FOR DRYING PRINTED SHEETS ON OFFSET PRINTING PRESSES

Julius Staffer, Mauer; Karl-Heinz Walther, and Hans-Georg Jahn, both of Wiesenbach, all of Fed. Rep. of Germany, assignors to Heidelberger Druckmaschinen, Heidelberg, Fed. Rep. of Germany

Filed Oct. 20, 1982, Ser. No. 435,390
Claims priority, application Fed. Rep. of Germany, Oct. 30, 1981, 3143089
Int. Cl.³ B41F 23/04
U.S. Cl. 101—416 A 6 Claims

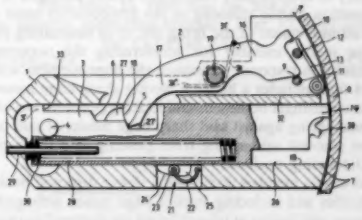


1. Device for drying printed sheets on an offset printing machine, comprising infrared radiators disposed above a delivery pile of the sheets and between an upper and a lower run of an endless delivery chain, said infrared radiators being substantially vertically displaceable transversely to said upper and lower means from a rest position into a working position thereof directly above the sheets, blowers displaceable substantially horizontally and parallel to said upper and said lower runs between a rest position thereof, which is located above the delivery pile of the sheets and intermediate said upper and said lower runs, and a working position thereof coinciding with said working position of said infrared radiators, first means for displacing said infrared radiators out of said working position thereof and into said rest position thereof, and second means for displacing said blowers individually from said rest position thereof into said working position thereof after said infrared heaters have been displaced into said rest position thereof whereby said infrared radiators are replaceable by individual ones of said blowers to change the mode of operation of the device.

4,449,454
SAFETY MECHANISM FOR AN EXPLOSIVE BODY

Josef Liebhardt, Schrobenhausen; Rudolf Fuhrer, Baar, and Erich Dautel, Schrobenhausen, all of Fed. Rep. of Germany, assignors to Messerschmitt-Boelkow-Blohm Gesellschaft mit beschraenkter Haftung, Munich, Fed. Rep. of Germany

Filed Oct. 19, 1982, Ser. No. 435,325
Claims priority, application Fed. Rep. of Germany, Nov. 3, 1981, 3143514
Int. Cl.³ F42C 9/06, 15/04, 15/28
U.S. Cl. 102—226 10 Claims



1. A safety mechanism for an explosive body adapted for expulsion from a launching tube in which the explosive body may rest with its outer contour in sliding contact with the inner surface of a launching tube, comprising a fuse mechanism including a detonator forming a link in a firing chain, housing means (1) insertable into an explosive body, a slide member (3) having a plurality of stop shoulders (5, 6, 33) and carrying said detonator (4) for moving said detonator as a link into said firing chain, said slide member (3) being movably received in said housing means, first spring means (30) in said housing means urging said slide member (3) in a predetermined direction, locking lever means (2), journal means (19) tiltably supporting said locking lever means in said housing means for cooperation with at least two of said locking shoulders of said slide member (3) in a plurality of different slide member positions corresponding to different angular positions of said locking lever means (2), second spring means (31) biasing said locking lever means (2) in said plurality of positions, whereby each of said stop shoulders corresponds to a different angular position, a first of said angular positions defining the safety-on position of the slide member (3), a second of said angular positions defining an intermediate safety position of the slide member (3), a third of said angular positions defining the safety-off position of the slide member (3), whereby said slide member (3) in said first position permits the insertion of an explosive body into a launching tube, but prevents such insertion when the slide member is in its second or third position.

4,449,455

INERTIA FUSE WITH A SELF-DESTRUCT DEVICE FOR USE IN SPINNING PROJECTILES

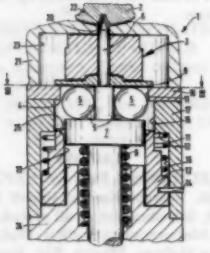
Andreas Halssig, Schramberg, Fed. Rep. of Germany, assignor to Gebruder Junghans GmbH, Schramberg, Fed. Rep. of Germany

Filed May 4, 1982, Ser. No. 374,712

Claims priority, application Fed. Rep. of Germany, May 15, 1981, 3119369

Int. Cl.³ F42C *15/26*

U.S. Cl. 102—234 **10 Claims**



1. An inertia fuse for spinning projectiles, said fuse being of the self-destruct type having a detonator, an impact responsive firing pin arranged to ignite the detonator, a detonator spring for urging the firing pin toward a detonating position, and a plurality of centrifugally-responsive bodies arranged in a locking position during spinning of the projectile to resist spring-induced movement of the firing pin to its detonating position, and an inertia member for accelerating the occurrence of detonation in response to impact, the improvement wherein:

said fuse includes a housing having sharp edge means,

said centrifugal bodies, in said locking position, are urged by said spring against said sharp edge means of said housing, to prevent said spring from pushing said firing pin to a detonating position,

said inertia member comprises a sleeve disposed behind said bodies and including impact edge means arranged to engage said bodies at impact locations disposed outwardly of those areas of the bodies against which the forces of the spring are applied when said bodies are in said locking position, to displace said bodies inwardly and out of engagement with said sharp edge means to release said spring in response to impact, and

safety means for opposing movement of said inertia member to prevent premature release of said spring.

4,449,456

SAFETY DEVICE FOR A PROJECTILE

Morten Foss, Tollerudbakken, and Kaare R. Strandli, Lyngveien, both of Norway, assignors to A/S Raufoss Ammunisjonsfabrikker, Raufoss, Norway

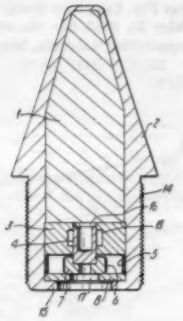
Filed Jan. 26, 1982, Ser. No. 342,811

Claims priority, application Norway, Sep. 21, 1981, 813195

Int. Cl.³ F42C *15/22, 15/34*

U.S. Cl. 102—240 **9 Claims**

1. A safety device for a projectile, adapted to make a barrier between an ignition charge in the forward end of the projectile and one or more incendiary and/or explosive charges behind the ignition charge, said device comprising two discs having concentric apertures and being situated behind the ignition charge, the disc nearer the ignition charge being called the foremost disc and the disc further from the ignition charge being called the rearmost disc, each of said foremost and rearmost discs having an aperture extending therethrough, wherein means adapted to make the barrier comprise a plug situated in the aperture through the foremost disc, and a split ring which is held together by a spring supports said plug, said split ring being supported by the rearmost disc, and at least one portion of said plug is adapted to seal the aperture in the foremost disc when being exposed to pressure developed by the ignition charge prior to arming of the projectile.



4,449,457

SAFETY DEVICE FOR THE FUZES OF NONSPINNING OR SLOWLY SPINNING PROJECTILES

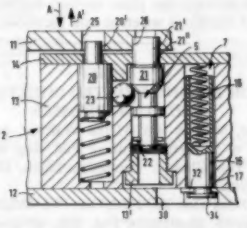
Andreas Halssig, Schramberg, Fed. Rep. of Germany, assignor to Gebruder Junghans GmbH, Schramberg, Fed. Rep. of Germany

Filed Feb. 24, 1982, Ser. No. 351,865

Claims priority, application Fed. Rep. of Germany, Mar. 7, 1981, 3108659

Int. Cl.³ F42C *15/24*

U.S. Cl. 102—251 **5 Claims**



1. A safety arrangement in fuzes for projectiles of the nonspinning and slow spinning type, said safety arrangement being of the type including a frame, a rotatably driven rotor mounted on said frame and carrying a detonator, and first safety means for preventing rotation of said rotor to an active position and movable in response to acceleration of the projectile upon firing to release the rotor, the improvement comprising second safety means which includes:

a bolt carried by said rotor and including a base on its lower side,

said bolt being arranged for movement in the direction of acceleration,

stop means on said frame including a collar overlying said base when said second safety means is in a locking position, to prevent movement of said bolt in said direction of acceleration,

said stop means permitting rotation of said rotor and bolt within a limited safety range,

an orifice disposed in said frame and sized at least as large as said base and positioned to be in alignment with said base only after a predetermined amount of rotation of said rotor, to permit said base to travel past said collar in said

direction of acceleration after said predetermined amount of rotation of said rotor.

4,449,458

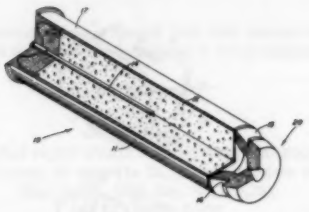
CARTRIDGE CASE CLOSURE PLUG

Michael E. Buckley; Thomas N. Tschirn, both of Dahlgren; Donald R. McClure, King George, all of Va., and Michael S. Wieland, Clairton, Pa., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 22, 1982, Ser. No. 360,273

Int. Cl.³ F42B *5/02*

U.S. Cl. 102—430 **7 Claims**



1. A plug for closing the open end of a propellant-containing cartridge case which has an inturned rim at its open end comprising:

a plug body of low density resilient foam material having a forward end and a rearward end;

said plug body including a tapered peripheral portion adjacent its rearward end adapted to be inserted into the cartridge case open end for complementary seating resiliently against the inturned rim for temporarily restraining it therein under pressure of gases when the propellant is activated;

a depression in the forward end of the plug body;

a cavity in the rearward end of the plug body to reduce the mass thereof and to reduce the thickness of the plug between the depression and the cavity to define a membrane;

whereby propellant combustion gases reaching the cavity first rupture the membrane while still exerting a force circumferentially on the cartridge case rim for momentarily holding the plug tapered portion in place thereagainst to allow reduction of pressure gradient across the membrane to reduce pressure forces propelling plug complete breakup fragments forward.

4,449,459

PIVOTING HEAD CONTINUOUS TAMPER

Ivo Cicin-Sain, Bussigny, Switzerland, assignor to Canron Corp., West Columbia, S.C.

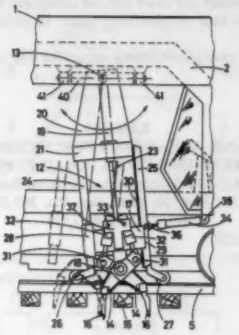
Filed Jan. 21, 1982, Ser. No. 341,344

Claims priority, application Switzerland, Jan. 23, 1981, 428/81

Int. Cl.³ E01B *27/16*

U.S. Cl. 104—12 **12 Claims**

1. In a railroad track tamping machine of the continuous movement type including a machine frame, a tamping unit depending from said machine frame and penduously mounted thereon about a frame lateral axis, on mounting means; extensible positioning means connected on the one hand to said tamping unit and on the other hand to said frame and adapted to swing the tamping unit, during machine frame track movement, in pendulous fashion forwardly longitudinally of the frame from one track tamping location to a succeeding track tamping location and, in operation, to position said tamping unit at a track tamping location to enable said tamping unit to



perform a tamping operation thereat, during machine frame track movement.

4,449,460

PROCESS AND APPARATUS, MAINLY FOR BURNING AGRICULTURAL PLANT REFUSE

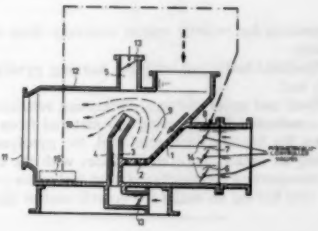
Bátyi Béla; Gulyás Géza, both of Budapest; Bozsó Zoltán, Dunakeszi; Csákány István, and Bartucz János, both of Budapest, all of Hungary, assignors to Láng Gépgyár, Budapest, Hungary

Filed Mar. 16, 1982, Ser. No. 358,811

Claims priority, application Hungary, Mar. 17, 1981, 670/81

Int. Cl.³ F23B *5/00*

U.S. Cl. 110—214 **4 Claims**



1. An apparatus for burning agricultural materials having a moisture content no greater than 45% by weight comprising:

a housing;

a baffle wall formed in said housing and dividing same into preburning and afterburning spaces, said wall having an upper portion inclined toward said preburning space and being further formed with at least one secondary air inlet;

a first grating arranged horizontally in said preburning space adjacent said baffle wall;

a second grating arranged in said preburning space adjacent said first grating and inclined upwardly therefrom, said second grating being juxtaposed with an inlet for the introduction of said material in a constant flow;

a first air duct connected to an upper portion of said second grating for delivering a first portion of primary air thereto for the removal of moisture from said material;

a second air duct connected to a lower portion of said grate for delivering a second portion of primary air thereto for the air-deficient burning of the dried material and the production of combustible gases;

a third air duct connected to said first grate for delivering a third portion of primary air thereto for driving said com-

bustible gases along said baffle wall for the deflection of said gases in a counterflow to the flow of said material, said gases mixing with secondary air introduced through said secondary air inlet for the complete burning of said mixture in said afterburning space to produce a hot gas; and

an outlet in said afterburning space for the removal of said hot gas.

4,449,461

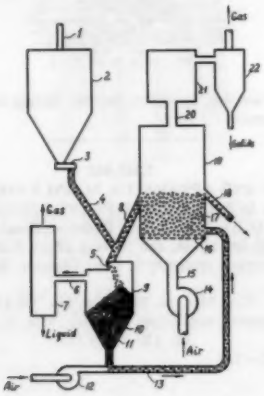
PROCESS AND APPARATUS FOR HYDROCARBONS RECOVERY FROM SOLID FUELS

Jacob Gorbulsky, 128 Milton Ave., Ballston Spa, N.Y. 12020

Filed Nov. 10, 1981, Ser. No. 367,554

Int. Cl.³ F23D *1/00*

U.S. Cl. 110—229 **7 Claims**



1. Apparatus for volatile matter recovery from solid fuels comprising:

(a) a fluidized-bed combustor for burning pyrolyzed solid fuel, and

(b) a fixed bed pyrolyzer in a connecting relationship with the combustor for receiving hot material from the combustor for heating fresh solid fuel, the pyrolyzer further having an outlet that communicates with the combustor for transporting the pyrolyzed solid fuel to the combustor, and also having an outlet for volatile matter discharge.

4,449,462

COAL BURNING APPARATUS

Michael F. Robb, Bismarck, N. Dak., assignor to King Coal Furnace Corporation, Bismarck, N. Dak.

Filed Sep. 28, 1982, Ser. No. 425,547

Int. Cl.³ F23K *3/10*

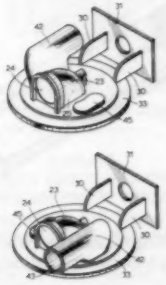
U.S. Cl. 110—288 **11 Claims**

9. A coal burning apparatus actuated by an auger-type stoker including a burner base plate, a coal inlet tube extending generally horizontally below the base plate, said inlet tube forming an elbow and extending upwardly through the center portions of said base plate to define a coal discharge port a distance above the upper surface of said base plate;

a first ring portion at the periphery of said base plate forming a generally upwardly facing planar annular surface and defining an annular recessed trough adjacent the outer edge of the base plate;

a plurality of burner rings supported on said base plate and stacked in vertical direction, said burner rings having open central portions surrounding the inlet tube and having outer peripheral surfaces of decreasing size in vertical upward direction, said burner rings being spaced apart in vertical direction to form generally horizontal air discharge passageways between adjacent burner rings that provide airflow paths extending generally parallel to the adjacent burner rings beyond the outer edges of the lower of the adjacent burner rings for each such airflow path, the upper one of the burner rings surrounding the coal discharge port and receiving coal discharged therefrom, the lowermost burner ring having an outer peripheral edge spaced inwardly from the first ring portion, each burner ring having an upwardly facing annular surface exposed to support coal supplied from the coal discharge port and moving downwardly toward the trough under gravity;

means comprising large port means to provide a supply of combustion air under pressure to the open central portions of the burner rings, air diffuser means between the port



means and the open central portions to distribute air to the open central portions prior to being directed substantially horizontally outwardly through the air discharge passageways;

a rotating ash ring rotatably mounted for rotational movement on the upwardly facing planar surface of said first ring portion and being spaced outwardly from the burner rings and supported only on the first ring portion, said rotating ash ring having an inner edge surface that is beveled outwardly in upward direction and terminating at a level above the lowermost burner plate; and

means actuated by said stoker drive to rotate said rotating ash ring to cause ashes forming between the burner rings and said rotating ash ring to be engaged by the ash ring and discharged outwardly as the ashes build up.

4,449,463

FABRIC TENSIONING DEVICE

Andrew J. Gilbride, Swampscott; Edward S. Malecki, South Peabody; Edward H. Winslow, III, Beverly, and Robert F. Coleman, Danvers, all of Mass., assignors to USM Corporation, Farmington, Conn.

Filed Feb. 12, 1982, Ser. No. 348,460

Int. Cl.³ D05B *21/00*

U.S. Cl. 112—121.26 **9 Claims**

1. A mechanism for tensioning a web of material during stitching thereof by a sewing machine arranged on a work supporting base, said mechanism comprising:

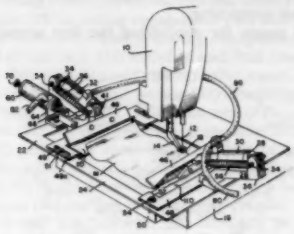
a frame movably arranged on said supporting base;

an arrangement of clamping means disposed on said frame, adapted to secure said web of material to said frame;

a biasing means for moving at least one of said clamping means with respect to said frame to effectuate the tensioning of said web of material between said clamping means;

said clamping means comprising a clamping bar which is pivotable about a support axis to effect pressure against a bracket disposed on said frame; said clamping means being

arranged on said bracket slidably disposed on said frame; and



an adjustment means arranged with said biasing means to control the distance any material is being tensioned.

4,449,464

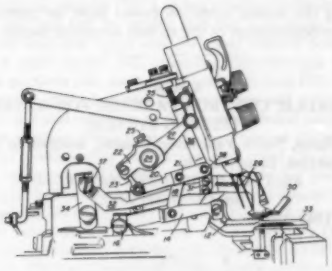
WALKING FOOT FEED FOR SEWING MACHINES

Robert E. Porter, 18 Tally Ho Dr., Hamilton, Mass. 01936

Filed Oct. 4, 1982, Ser. No. 435,281

Int. Cl.³ D05B *27/06*

U.S. Cl. 112—311 **9 Claims**



1. In a sewing machine having a source of driving power, a presser foot and a walking foot top feed, the combination of a beam supporting said walking foot top feed, an arm supporting said presser foot, an independent pivoting beam, means pivotally connecting said independent beam to said arm and to said walking-foot supporting beam and means connecting said independent beam to said source of driving power to cause said walking-foot top feed to travel in a substantially out-of-phase relationship with said presser foot.

4,449,465

UNIVERSAL STITCHING GUIDE

Dorothy Y. Kirby, 633 Linden St., Clermont, Fla. 32711

Filed Sep. 16, 1982, Ser. No. 419,021

Int. Cl.³ D05B *55/06*

U.S. Cl. 112—153 **6 Claims**

1. A stitching guide adapted to be used with a sewing machine having a steel needle plate and bed plate comprising:

a guide plate fabricated from flexible magnetized rubber-like material, said guide plate having at least one straight edge and one convexly curved edge; and

a thin steel mounting plate having a top side and a bottom side, said bottom side having a coating of pressure sensitive adhesive, said mounting plate adapted to be attached by said adhesive to the bed plate of a sewing machine, said guide plate thereby magnetically mountable on said steel

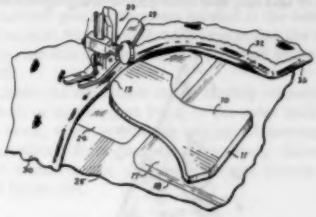


plate to place said edges selectively in position to permit guiding of material being stitched.

4,449,466

SAILBOARD

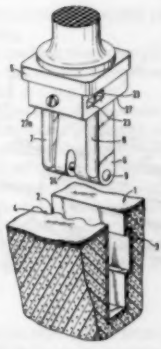
Hannes Marker, Hauptstrasse 51-53, 8100 Garmisch-Partenkirchen, and Otto Hüss, Wallgau, both of Fed. Rep. of Germany, assignors to Hannes Marker, Garmisch-Partenkirchen, Fed. Rep. of Germany

Filed Dec. 7, 1981, Ser. No. 328,249

Claims priority, application Fed. Rep. of Germany, Dec. 8, 1980, 3046230; Jan. 19, 1981, 3101465

Int. Cl.³ B63B *15/00*

U.S. Cl. 114—91 **30 Claims**



1. An apparatus for detachably connecting a mast having a mast base to a sailboard, said apparatus comprising a tongue connected to the mast base; an elongated recess in the top of the sailboard for receiving said tongue, said elongated recess extending in the longitudinal direction of the top of the sailboard; vertically-extending parallel grooves which are located in a lateral surface of said elongated recess, said grooves being longer in length than said tongue; at least one projection on a side of said tongue said projection being provided to engage with said vertically-extending parallel grooves.

4,449,467

VARIABLE WEIGHT CLOTH ROLLER-FURLING SAIL

Herbert A. Hild, Rye, and Walter Scanlon, Bronx, both of N.Y., assignors to Hild Sails, Inc., Bronx, N.Y.

Filed Jun. 28, 1982, Ser. No. 392,680

Int. Cl.³ B63H *9/04*

U.S. Cl. 114—103 **6 Claims**

1. A roller furling sail of Scotch-cut design including a plurality of integral panels of varying weight sail cloth wherein an outermost panel that runs along the leach of said sail and the lowermost panel that runs along the foot of the sail are made of

the heaviest weight sail cloth; said sail further including at least one inner panel arranged parallel to said outermost panel that runs along the leach and said lowermost panel that runs along the foot of said sail, said inner panels being lighter weight cloth

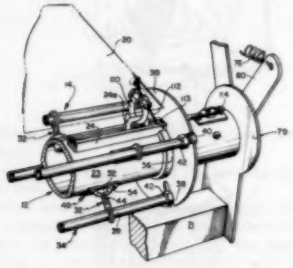
than said outermost and lowermost panels such that the weight of each panel decreases progressively towards the luff of said sail, all panels of said varying weight sail cloth being of substantially the same width.

4,449,468

ADJUSTABLE ROLLER FURLING SPAR

Walter A. Schulz, Portsmouth, and John H. Procter, East Providence, both of R.I., assignors to Schulz Marine Systems, Inc., Bristol, R.I.

Filed May 19, 1983, Ser. No. 495,960
Int. Cl.³ B63H *9/10*
U.S. Cl. 114—104 **22 Claims**



1. An adjustable roller furling spar for a sailboat comprising:
a. an elongated substantially rigid spar base member rotatably securable on said boat;
b. adjustable periphery means attached to said spar base member adjustably defining the effective winding cross section of said spar at a plurality of points spaced along substantially the entire longitudinal extent thereof;
c. means for securing a sail to said spar; and
d. means for rotating said spar base member and the periphery means attached thereto and for adjustably securing them in a selected rotated position.

4,449,469

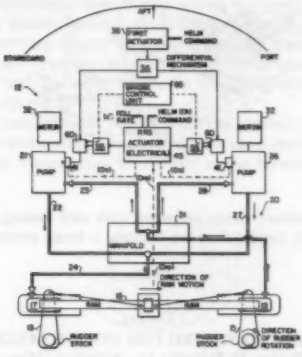
MECHANICAL CLUTCH/DECOUPLER FOR HYDRAULIC PUMPS

Dennis A. Woolaver, Rockville, Md., and A. Erich Baitis, Stafford, Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 25, 1981, Ser. No. 247,486
Int. Cl.³ B63H *25/22*
U.S. Cl. 114—150 **7 Claims**

1. In a ship steering system having pump means controlling hydraulically actuated rudders, a first actuation means for translating a helm command signal into a mechanicl control signal for the pump means, and a second actuation means for translating a combined helm and ship roll reduction command signal into a mechanical control signal for the pump means, the improvement comprising:

coupling means for decoupling the first actuation means



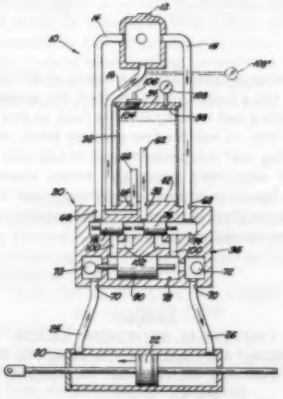
from the pump means and for coupling the second actuation means with the pump means upon activation of the second actuation means, said coupling means coupling the first actuation means with the pump means and decoupling the second actuation means from the pump means upon deactivation of the second actuation means.

4,449,470

HYDRAULIC CONTROL PACKAGE FOR A MARINE STEERING SYSTEM

Martin Rump, North Vancouver, Canada, assignor to Teleflex Incorporated, Limerick, Pa.

Filed Feb. 18, 1982, Ser. No. 349,734
Int. Cl.³ B63H *25/22*
U.S. Cl. 114—150 **19 Claims**



1. A hydraulic control assembly (30) for use in a marine steering system (10) of the type having a steering pump (12) with port and starboard fluid outlets (14, 16) and a return inlet (18), a steering cylinder (20) with a piston (22) therein and port and starboard inlets (24, 26) for hydraulically moving the piston (22) back and forth in the cylinder (20) in response to fluid delivered from the pump (12), said assembly (30) comprising; a fluid reservoir (32, 34, 36) for supplying fluid to said

steering system (10) and control valve means for controlling fluid flow in said system, said assembly (30) being characterized by including a tube (32) having first and second open ends, a cap member (34) in sealing engagement with said first end of said tube, a valve body (36) in sealing engagement with said second end of said tube (32) to define said fluid reservoir, said valve body (36) including said control valve means, said valve body (36) including a central portion (52) extending in a direction away from said second end of said tube (32) and a pair of side portions (54) extending along opposite sides of said central portion (52) and being removably attached to said central portion (52), each of said side portions (54) including a cylinder passage (70) for establishing fluid communication between said central portion (54) and one of the steering cylinder outlets (24, 26), each of said side portions (54) including a pump inlet passage (68) communicating with said central portion (52) for receiving fluid from one of the pump outlets (14, 16), a check valve (72) disposed in said cylinder passage (70) in each of said side portions (54), said central portion (52) having a shuttle bore (74) extending therethrough between said side portions (54) and communicating with said pump inlet passages (68), shuttle valve means (76) slidably disposed in said shuttle bore (74), said central portion (54) having a spool bore (78) extending therethrough between said side portions (54) and communicating with said cylinder passages (70), spool valve means (80) slidably disposed in said spool bore (78), each of said side portions (54) having a first pocket (82) therein about said cylinder passage (70) and facing said spool bore (78), a first valve seat (84) disposed in said first pocket (82) and engaging said central portion (54), said check valve (72) being a ball disposed in said cylinder passage (70), a spring reacting between the side portion and said ball for urging said ball into sealing engagement with said first valve seat (84), said central portion (54) having a relief cavity (92) extending therethrough between said side portions (54), each of said side portions (54) having a relief passage (94) communicating between said cylinder passage (70) and said relief cavity (92) in said central portion (54), each side portion (54) having a second pocket therein about said relief passage (94) and facing said relief cavity (92), a second valve seat (96) disposed in said second pocket and engaging said central portion (54), a relief (98) disposed in each end of said relief cavity (92) and engaging said second valve seat (84), said central portion (54) having passages (100, 101) therein communicating between said shuttle bore (74) and said spool bore (78) and controlled by said shuttle valve means (76), said central portion (52) including a reservoir inlet passage (62) extending to a first opening into said tube (32) and a pump outlet passage extending from a second opening into said tube (32) to the pump return outlet (18), and a passage (58) between said relief cavity (97) and said reservoir inlet passage (62), said spool valve means (80) including extensions from each end thereof for opening said check valves (72).

4,449,471

STEERING COMBINATION OF PUSHER TUG AND BARGES

Johannes van Roon, A 74, 2975 BC Ottoland, Netherlands

Filed Dec. 12, 1980, Ser. No. 215,913

Claims priority, application Netherlands, Dec. 13, 1979, 7908998

Int. Cl.³ B63B *21/62*

U.S. Cl. 114—249 **20 Claims**

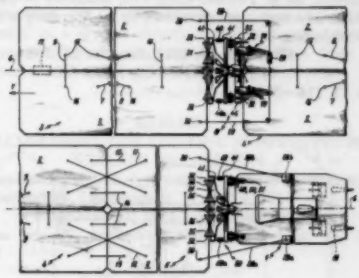
1. A steerable pushing means for connecting together a combination of a pusher tug with a barge unit, said pushing means comprising:

(a) a support frame slidably connected at each end to dual side stemsons of the tug by vertically slidable means, said support frame being vertically movable relative to the tug during use;

(b) a pusher beam having a relatively flat front pusher surface rigidly connectable to a barge unit, said pusher beam having a central substantially vertical pivot column which is substantially perpendicular to the centerline of the tug and barge combination, said pivot cooperating with a substantially vertical trough portion of a central main stemson attached to the pusher tug, said pusher beam being supported by said support frame;

(c) dual vertical guiding elements located at the outer ends of said support frame and slidably connecting the support frame to said side stemsons rigidly attached to the pusher tug; and

(d) extendable and retractable means flexibly connecting the outer ends of said support frame to the outer ends of said pusher beam, whereby pushing and lateral steering forces are transmitted from the tug successively through the support frame to the pusher beam and thence to the pushed barge unit.



16. A method for connecting a steerable pushing means onto a barge unit, comprising

(a) providing a first pushing means having vertically adjustable guide means and having an opening on its upper side and being attached to a tug boat;

(b) placing said first pushing means under a second pushing means having a downwardly directed pin on its lower side and being attached to a barge unit;

(c) loosening attachment means between said second pushing means and the barge unit and lifting said second pushing means from the barge by raising said guide means on said first pushing means; and

(d) transporting said second pusher means to another barge unit and installing the second pusher means thereon.

4,449,472

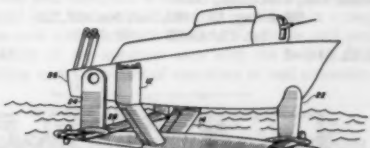
DETACHABLE STORAGE TANK FOR HYDROFOILS

John R. Meyer,Jr., Deerwood, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 28, 1982, Ser. No. 383,074

Int. Cl.³ B63B *1/24, 1/28*

U.S. Cl. 114—274 **6 Claims**



1. A submerged storage tank for a hydrofoil ship, said storage tank comprising:

an elongated torpedo shaped hull;

a plurality of hull foils permanently connected to said hull and separate from the foils of said ship;

a plurality of struts extending generally upwardly from said hull foils; and

at least one attachment means at the upper end of each strut detachably connecting said storage tank to the hull of said ship;

said ship being operable with the attachment of said storage tank using both the ship foils and the hull foils; and with the detachment of said storage tank using the ship foils;

whereby the attachment of said storage tank or lack thereof does not detrimentally affect the operation of said hydrofoil ship.

4,449,473

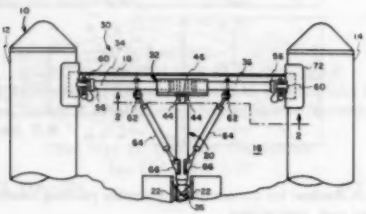
INFLATABLE BOAT WITH DEMOUNTABLE TRANSOM

William W. McCrory; William B. Quigley, and William A. Garnett, all of Panama City, Fla., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 29, 1982, Ser. No. 437,708

Int. Cl.³ B63C *9/04*; B63B *7/08*

U.S. Cl. 114—354 **8 Claims**



1. In combination with an inflatable boat having spaced, parallel side sponsons joined by a transverse floor, and a rigid keelson, a demountable transom for supporting an outboard motor, said transom comprising:

a pad structure comprising spaced front and rear walls, web means interconnecting said walls, and means for connecting said pad structure to the aft end of said keelson;

first and second attachment arms each having an inner end pivotally connected to said pad structure for movement between folded, side-by-side positions and opened, axially aligned end-to-end positions, said arms having first connecting means at their outer ends for releasable connection to cooperating second connecting means on said side sponsons; and

brace means for connecting intermediate portions of said arms to said keelson.

4,449,474

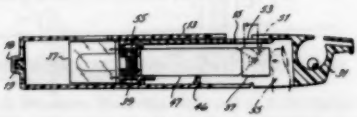
PERSONAL SECURITY DEVICE

James F. Mariol, Cincinnati, Ohio, assignor to Suzi Stone Enterprises, Inc., Cincinnati, Ohio

Filed Aug. 13, 1982, Ser. No. 407,729

Int. Cl.³ G08B *15/02*, *7/00*

U.S. Cl. 116—2 **13 Claims**



1. A personal security device comprising:

an inner housing having an open interior;

an outer housing formed to receive said inner housing therewith, said inner housing being movable within said outer housing between a closed position wherein the interior of said inner housing is covered by said outer housing and an extended position wherein at least a portion of said inner housing interior is exposed;

protection means disposed within said inner housing, said protection means including:

flash means having at least one electrical contact;

a canister movable within said inner housing and containing a fluid irritant, said canister having a trigger adapted to be depressed for moving said canister within said inner housing and for releasing said fluid irritant from said canister; and

activation means disposed between said flash means and said canister, said activation means being operable to engage said electrical contacts for activating said flash means, whereby upon movement of said inner housing to said extended position said trigger is uncovered and then depressed to release said fluid irritant from said canister and move said activation means into engagement with said electrical contacts.

4,449,475

CLEANING DEVICE FOR THE INTERMEDIATE IMAGE CARRIER OF AN ELECTROPHORETIC PRINTER

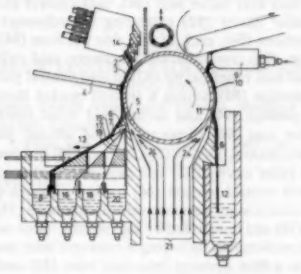
Franz Schinke, Hamburg, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 11, 1982, Ser. No. 357,249

Claims priority, application Fed. Rep. of Germany, Mar. 20, 1981, 31110878

Int. Cl.³ G03G *15/01*, *15/06*

U.S. Cl. 118—645 **5 Claims**



1. A device for the removal of toner suspension of different colors and/or a cleaning liquid from an endless intermediate image carrier upon which carrier toner suspension of different colors are successively applied and on which a color image is electrophoretically recorded, after which recording residues of the toner suspension are removed from the intermediate image carrier by means of forced air in order to be deposited in associated collecting reservoirs, characterized in that upper edges (**5**, **11**) of a stationary air duct (**21**) which is arranged underneath the intermediate image carrier (**1**) approach the intermediate image carrier (**1**) on both sides so closely that they form two narrow air gaps in conjunction therewith, each upper edge (**5**, **11**) of the air duct (**21**) being joined to the upper edge of a wiper (**6**) projecting therefrom, each of which wiper (**6**) is directed away from the intermediate image device (**1**), several chutes (**13**, **15**, **17**, **19**) being situated on one side of the air duct (**21**), said chutes being displaceable so that the upper side of a chute may be positioned underneath the wiper (**6**) on the said one side of the air duct (**21**) and its lower side may be positioned over the inlet opening of the associated, stationary collecting reservoir (**8**, **16**, **18**, **20**), all of the chutes (**13**, **15**, **17**, **19**) and the collecting reservoirs (**8**, **16**, **18**, **20**) for each of the toner suspensions (**3**) being situated on the said one side of the air duct and on the side of the air duct (**21**) which is situated opposite the collecting reservoir (**8**, **16**, **18**, **20**) for the toner

suspension (3) there being arranged a collecting reservoir (12) for cleaning liquid (10).

4,449,476

APPARATUS FOR COATING OR IMPREGNATING A GUIDED SUBSTRATE IN THE FORM OF A WEB

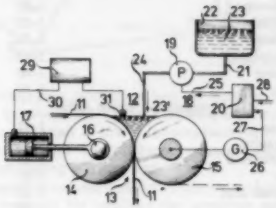
Gerhard Voswinckel, Aachen, and Joachim Trauter, Denkendorf, both of Fed. Rep. of Germany, assignors to Gebrueder Sucker, Monchen-Gladbach, Fed. Rep. of Germany

Filed Jan. 28, 1983, Ser. No. 462,064

Claims priority, application Fed. Rep. of Germany, Jan. 30, 1982, 3203087

Int. Cl.³ B05B *7/06*

U.S. Cl. 118—674 **12 Claims**



1. Apparatus for coating or impregnating a guided web-shaped substrate with a flowable medium, comprising a feeding location through which the substrate is moved and is impinged by the flowable medium, means disposed in vicinity of said feeding location for controllably transferring the flowable medium to the substrate, a metering device for the flowable medium having an outlet in communication with said feeding location and an inlet, a storage tank for the flowable medium being connected to said inlet, means operatively connected to said metering device for measuring the rate of travel of the substrate, and means operatively connected to said transferring means for regulating and constantly maintaining the amount of flowable medium at said feeding location.

4,449,477

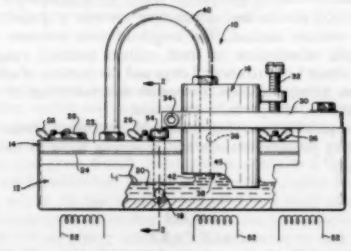
LIQUID DISPENSER

Paul A. Davignon, Uxbridge, Mass., assignor to American Optical Corporation, Southbridge, Mass.

Filed Feb. 16, 1982, Ser. No. 349,102

Int. Cl.³ B05C *3/09*

U.S. Cl. 118—694 **8 Claims**



1. A liquid dispenser comprising:

an open dispensing tray;

a closed reservoir, there being a tray filling opening extending from said reservoir to said tray at a point beneath a level of a liquid to be provided to and maintained in said tray;

and an adjustable liquid level control nozzle having a level sensing surface positioned in said tray to maintain a desired tray liquid level and an air passage extending from said sensing surface into said closed reservoir;

wherein a portion of said level sensing surface of said nozzle extends approximately parallel to the liquid level to be maintained in said tray and said air passage extends away from said portion of said nozzle sensing surface;

whereby, when the tray liquid level drops below the level to be maintained, a liquid meniscus traverses past said air passage, thereby venting said air passage and allowing air to enter said closed reservoir, releasing a liquid which is provided to said closed reservoir to flow through said tray filling opening into said open tray;

whereby, when the tray liquid level rises to the level to be maintained, the liquid meniscus traverses past said air passage in a reverse direction, thereby closing said air passage and preventing further liquid flow from said closed reservoir through said tray filling opening.

4,449,478

ARRANGEMENT FOR COATING SUBSTRATES BY VACUUM DEPOSITION

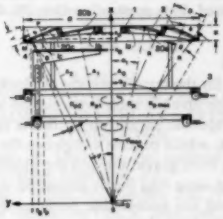
Thaddäus Kraus, Triesen, Switzerland, assignor to Balzers Aktiengesellschaft, Liechtenstein

Filed Mar. 11, 1982, Ser. No. 357,334

Claims priority, application Switzerland, Mar. 13, 1981, 1720/81

Int. Cl.³ C23C *13/08*

U.S. Cl. 118—720 **2 Claims**



1. An arrangement for coating substrates in an apparatus for vacuum deposition, comprising a rotatable substrate holding structure, means supporting said holding structure for rotation about a rotational axis, at least one evaporative source provided close to said rotational axis, a vapor beam correction screen located between said evaporative source and said holding structure, supporting means supporting said vapor beam correction screen for rotation in an opposite direction about the same rotational axis, said holding structure comprising a circular plate provided with holders for substrates located such as to hold said substrates in discreet circular rows around the rotational axis, each with their axes positioned in a singular circular row which intersect the axis of rotation, said point of intersection of the substrate axes with the axis of rotation coinciding with the center of curvature of said substrates.

4,449,479

CRAYFISH, HARVESTING, SHELTERING AND SPACING APPARATUS

Howard J. Saucier, Rt. 2, Box 267-B, St. Martinville, La. 70582

Filed May 2, 1983, Ser. No. 490,392

Int. Cl.³ A01K *61/00*

U.S. Cl. 119—2 **3 Claims**

1. A method of harvesting crayfish in a pond comprising:

(a) positioning in spaced apart fashion in said pond devices, each comprising a submersible body positionable on the bottom of the pond and having a center cavity opening to the pond bottom, said body being further provided with at

at least one attachment means at the upper end of each strut detachably connecting said storage tank to the hull of said ship;

said ship being operable with the attachment of said storage tank using both the ship foils and the hull foils; and with the detachment of said storage tank using the ship foils;

whereby the attachment of said storage tank or lack thereof does not detrimentally affect the operation of said hydrofoil ship.

4,449,473

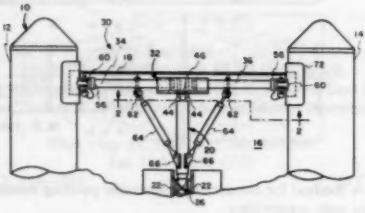
INFLATABLE BOAT WITH DEMOUNTABLE TRANSOM

William W. McCrory; William B. Quigley, and William A. Garnett, all of Panama City, Fla., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 29, 1982, Ser. No. 437,708

Int. Cl.³ B63C *9/04*; B63B *7/08*

U.S. Cl. 114—354 **8 Claims**



1. In combination with an inflatable boat having spaced, parallel side sponsons joined by a transverse floor, and a rigid keelson, a demountable transom for supporting an outboard motor, said transom comprising:

a pad structure comprising spaced front and rear walls, web means interconnecting said walls, and means for connecting said pad structure to the aft end of said keelson;

first and second attachment arms each having an inner end pivotally connected to said pad structure for movement between folded, side-by-side positions and opened, axially aligned end-to-end positions, said arms having first connecting means at their outer ends for releasable connection to cooperating second connecting means on said side sponsons; and

brace means for connecting intermediate portions of said arms to said keelson.

4,449,474

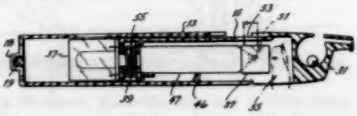
PERSONAL SECURITY DEVICE

James F. Mariol, Cincinnati, Ohio, assignor to Suzi Stone Enterprises, Inc., Cincinnati, Ohio

Filed Aug. 13, 1982, Ser. No. 407,729

Int. Cl.³ G08B *15/02*, *7/00*

U.S. Cl. 116—2 **13 Claims**



1. A personal security device comprising:

an inner housing having an open interior;

an outer housing formed to receive said inner housing therewith, said inner housing being movable within said outer housing between a closed position wherein the interior of said inner housing is covered by said outer housing and an extended position wherein at least a portion of said inner housing interior is exposed;

protection means disposed within said inner housing, said protection means including:

flash means having at least one electrical contact;

a canister movable within said inner housing and containing a fluid irritant, said canister having a trigger adapted to be depressed for moving said canister within said inner housing and for releasing said fluid irritant from said canister; and

activation means disposed between said flash means and said canister, said activation means being operable to engage said electrical contacts for activating said flash means, whereby upon movement of said inner housing to said extended position said trigger is uncovered and then depressed to release said fluid irritant from said canister and move said activation means into engagement with said electrical contacts.

4,449,475

CLEANING DEVICE FOR THE INTERMEDIATE IMAGE CARRIER OF AN ELECTROPHORETIC PRINTER

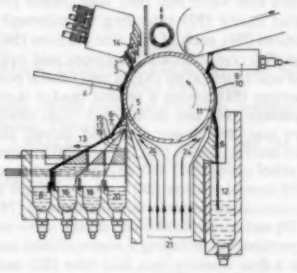
Franz Schinke, Hamburg, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 11, 1982, Ser. No. 357,249

Claims priority, application Fed. Rep. of Germany, Mar. 20, 1981, 31110878

Int. Cl.³ G03G *15/01*, *15/06*

U.S. Cl. 118—645 **5 Claims**



1. A device for the removal of toner suspension of different colors and/or a cleaning liquid from an endless intermediate image carrier upon which carrier toner suspension of different colors are successively applied and on which a color image is electrophoretically recorded, after which recording residues of the toner suspension are removed from the intermediate image carrier by means of forced air in order to be deposited in associated collecting reservoirs, characterized in that upper edges (**5**, **11**) of a stationary air duct (**21**) which is arranged underneath the intermediate image carrier (**1**) approach the intermediate image carrier (**1**) on both sides so closely that they form two narrow air gaps in conjunction therewith, each upper edge (**5**, **11**) of the air duct (**21**) being joined to the upper edge of a wiper (**6**) projecting therefrom, each of which wiper (**6**) is directed away from the intermediate image device (**1**), several chutes (**13**, **15**, **17**, **19**) being situated on one side of the air duct (**21**), said chutes being displaceable so that the upper side of a chute may be positioned underneath the wiper (**6**) on the said one side of the air duct (**21**) and its lower side may be positioned over the inlet opening of the associated, stationary collecting reservoir (**8**, **16**, **18**, **20**), all of the chutes (**13**, **15**, **17**, **19**) and the collecting reservoirs (**8**, **16**, **18**, **20**) for each of the toner suspensions (**3**) being situated on the said one side of the air duct and on the side of the air duct (**21**) which is situated opposite the collecting reservoir (**8**, **16**, **18**, **20**) for the toner

suspension (3) there being arranged a collecting reservoir (12) for cleaning liquid (10).

4,449,476

APPARATUS FOR COATING OR IMPREGNATING A GUIDED SUBSTRATE IN THE FORM OF A WEB

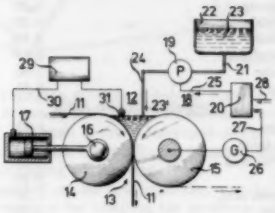
Gerhard Voswinckel, Aachen, and Joachim Trauter, Denkendorf, both of Fed. Rep. of Germany, assignors to Gebrueder Sucker, Monchen-Gladbach, Fed. Rep. of Germany

Filed Jan. 28, 1983, Ser. No. 462,064

Claims priority, application Fed. Rep. of Germany, Jan. 30, 1982, 3203087

Int. Cl.³ B05B 7/06

U.S. Cl. 118—674 **12 Claims**



1. Apparatus for coating or impregnating a guided web-shaped substrate with a flowable medium, comprising a feeding location through which the substrate is moved and is impinged by the flowable medium, means disposed in vicinity of said feeding location for controllably transferring the flowable medium to the substrate, a metering device for the flowable medium having an outlet in communication with said feeding location and an inlet, a storage tank for the flowable medium being connected to said inlet, means operatively connected to said metering device for measuring the rate of travel of the substrate, and means operatively connected to said transferring means for regulating and constantly maintaining the amount of flowable medium at said feeding location.

4,449,477

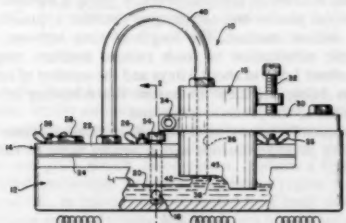
LIQUID DISPENSER

Paul A. Davignon, Uxbridge, Mass., assignor to American Optical Corporation, Southbridge, Mass.

Filed Feb. 16, 1982, Ser. No. 349,102

Int. Cl.³ B05C 3/09

U.S. Cl. 118—694 **8 Claims**



1. A liquid dispenser comprising:

an open dispensing tray;

a closed reservoir, there being a tray filling opening extending from said reservoir to said tray at a point beneath a level of a liquid to be provided to and maintained in said tray;

and an adjustable liquid level control nozzle having a level sensing surface positioned in said tray to maintain a desired tray liquid level and an air passage extending from said sensing surface into said closed reservoir;

wherein a portion of said level sensing surface of said nozzle extends approximately parallel to the liquid level to be maintained in said tray and said air passage extends away from said portion of said nozzle sensing surface;

whereby, when the tray liquid level drops below the level to be maintained, a liquid meniscus traverses past said air passage, thereby venting said air passage and allowing air to enter said closed reservoir, releasing a liquid which is provided to said closed reservoir to flow through said tray filling opening into said open tray;

whereby, when the tray liquid level rises to the level to be maintained, the liquid meniscus traverses past said air passage in a reverse direction, thereby closing said air passage and preventing further liquid flow from said closed reservoir through said tray filling opening.

4,449,478

ARRANGEMENT FOR COATING SUBSTRATES BY VACUUM DEPOSITION

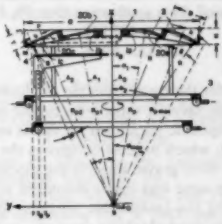
Thaddäus Kraus, Triesen, Switzerland, assignor to Balzers Aktiengesellschaft, Liechtenstein

Filed Mar. 11, 1982, Ser. No. 357,334

Claims priority, application Switzerland, Mar. 13, 1981, 1720/81

Int. Cl.³ C23C 13/08

U.S. Cl. 118—720 **2 Claims**



1. An arrangement for coating substrates in an apparatus for vacuum deposition, comprising a rotatable substrate holding structure, means supporting said holding structure for rotation about a rotational axis, at least one evaporative source provided close to said rotational axis, a vapor beam correction screen located between said evaporative source and said holding structure, supporting means supporting said vapor beam correction screen for rotation in an opposite direction about the same rotational axis, said holding structure comprising a circular plate provided with holders for substrates located such as to hold said substrates in discreet circular rows around the rotational axis, each with their axes positioned in a singular circular row which intersect the axis of rotation, said point of intersection of the substrate axes with the axis of rotation coinciding with the center of curvature of said substrates.

4,449,479

CRAYFISH, HARVESTING, SHELTERING AND SPACING APPARATUS

Howard J. Saucier, Rt. 2, Box 267-B, St. Martinville, La. 70582

Filed May 2, 1983, Ser. No. 490,392

Int. Cl.³ A01K 61/00

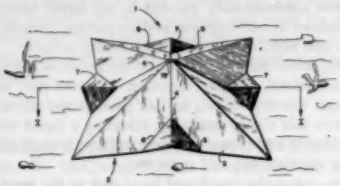
U.S. Cl. 119—2 **3 Claims**

1. A method of harvesting crayfish in a pond comprising:

(a) positioning in spaced apart fashion in said pond devices, each comprising a submersible body positionable on the bottom of the pond and having a center cavity opening to the pond bottom, said body being further provided with at

least one opening sized and positioned to allow crayfish to enter said cavity;

(b) placing young crayfish about said devices;



(c) placing crayfish traps during crayfish harvesting time periods near at least some of said devices; and

(d) periodically removing said crayfish traps to remove the crayfish found therein.

4,449,480

CULTURE OF FRESHWATER MUSSEL GLOCHIDIA IN AN ARTIFICIAL HABITAT UTILIZING COMPLEX LIQUID GROWTH MEDIA

Billy G. Ison, Killen, Ala., and Robert G. Hudson, Clinton, S.C., assignors to Tennessee Valley Authority, Muscle Shoals, Ala.

Continuation-in-part of Ser. No. 369,691, Apr. 19, 1982, abandoned, which is a continuation of Ser. No. 328,307, Dec. 7, 1981, abandoned. This application Oct. 29, 1982, Ser. No. 437,817

Int. Cl.³ A01K *61/00*

U.S. Cl. 119—4 **18 Claims**

1. A process for the transformation of glochidia of freshwater mussels to the juvenile stage wherein the normal period of presumed host specific parasitism on fish is reproduced in an artificial habitat, which process comprises the steps of:

(1) removing from gravid mussels the glochidia therein and transferring same into sterile deionized water wherefrom are removed the undesirable portions thereof including tissue debris, dead glochidia, bacteria, and protozoa;

(2) removing at least a portion of the resulting decontaminated glochidia from said sterile deionized water and transferring same into a mixture of complex artificial growth medium and fish blood plasma, said complex artificial growth medium having an adjusted pH of about 7.8 to about 8.0 and said complex artifical growth medium and said fish blood plasma containing predetermined quantities of antibiotics and antimycotics, said mixture of artificial growth medium and blood plasma ranging from about 20 to about 80 percent and about 80 percent to about 20 percent, respectively; said predetermined quantities of antibiotics and antimycotics in said artificial growth medium and said blood serum ranging in concentrations therein as follows:

Compound	Concentration
Antibiotics	
Streptomycin sulfate	400–2000 μg/ml
Penicillin G. sodium salt	400–2000 U/ml
Oxytetracycline	50–300 μg/ml
Antimycotic	
Amphotericin B	1–25 μg/ml

and said complex artificial growth medium comprising predetermined quantities of inorganic salts, amino acids, including essential amino acids and nonessential amino acids, vitamins, and other compounds including glucose as follows:

Compound	Concentration, mg/l
Inorganic salts	
$CaCl_2$	600–1400
$MgCl_2.6H_2O$	500–1200
NaCl	700–1700
KCl	50–125
$NaHCO_3$	1100–2400
Essential Amino Acids	
L-arginine	10–120
L-cystine	2–26
L-histidine	3–35
L-isoleucine	5–55
L-leucine	5–55
L-lysine	6–60
L-methionine	1–20
L-phenylalanine	3–35
L-threonine	5–50
L-tryptophane	1–12
L-tyrosine	3–40
L-valine	5–50
Nonessential Amino Acids	
L-alanine	1–12
L-asparagine	1–15
L-aspartic acid	1–15
glycine	1–10
L-glutamic acid	1–20
L-proline	1–15
L-serine	1–15
taurine	3–35
L-ornithine	1–12
Vitamins	
choline chlorine	0.1–2
folic acid	0.1–2
inositol	0.2–4
nicotinamide	0.1–2
calcium pantothenate	0.1–2
pyridoxal	0.1–2
riboflavin	0.1–2
thiamine	0.1–2
Other Compounds	
glucose	100–1500
phenol red - optional	1–15

(3) subjecting said glochidia in said mixture of artificial complex growth medium and said blood plasma to incubation means wherein the temperature is maintained from about 18° C. to about 28° C. and wherein carbon dioxide enriched air is introduced and withdrawn in sufficient quantities to effectively control the pH in said mixture in the range from about 7.2 to about 8.3;

(4) subsequently and periodically removing from contact with said glochidia the resulting culture medium comprising said mixture of complex artificial growth medium and fish blood plasma and substituting therefor a quantity of fresh culture medium, the length of time between said periodic substitution of fresh culture medium ranging from about 1 day to about 3 days and the number of substitutions being sufficient to ensure the maturing of said glochidia to the juvenile stage; and

(5) subsequently removing from said incubation means the resulting juvenile mussels and returning same to natural habitat.

4,449,481

CALF CART

Buck Dear, and Tim Spencer, both of 2312 Ninth Ave. S., Great Falls, Mont. 59405

Filed Aug. 24, 1982, Ser. No. 411,026

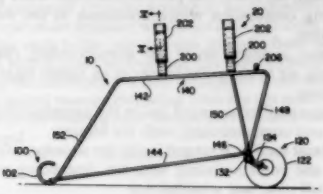
Int. Cl.³ A61D *3/00*

U.S. Cl. 119—96 **10 Claims**

1. A cart for transporting a new-born calf permitting its mother to closely follow comprising:

a frame, said frame including a front ground-engaging portion, rear ground-engaging portions, at least one central

longitudinal member interconnecting said front and rear portions, a lateral frame member interposed between said rear ground-engaging portions, a verticle post extending upwardly from said lateral frame member, an upper main member comprising said central longitudinal member, said main member being connected to said vertical post perpendicularly of said lateral frame member, a forward extension interconnecting said main member to said front



ground-engaging portion, a pair of vertical supports extending between said lateral frame member and said main member, and apair of lower longitudinal members extending between said lateral frame member and said front ground-engaging portion and

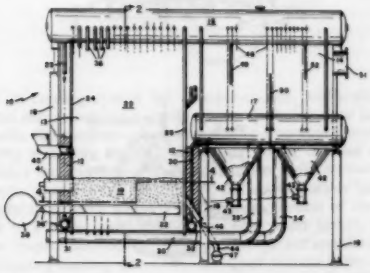
means supported on and positioned above said central longitudinal member for cradling the newborn calf in an upright position with its legs dangling and unable to touch ground with a minimum amount of structure being visible.

4,449,482

FLUIDIZED BED BOILERS

Albert M. Leon, Mamaroneck, N.Y., and Daniel E. McCoy, Williamsport, Pa., assignors to Dorr-Oliver Incorporated, Stamford, Conn.

Filed Apr. 28, 1982, Ser. No. 372,853
Int. Cl.³ F22B *1/02*; F23D *19/02*
U.S. Cl. 122—4 D **4 Claims**



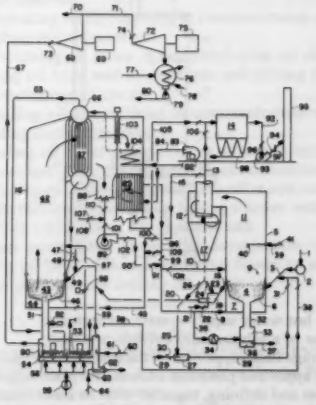
1. A fluidized bed boiler comprising a housing, a reaction chamber within said housing, an air distributor or grate in the lower portion of said reaction chamber comprising a plurality of spaced sparge pipes, a fluidized bed region immediately above said grate which, in operation, contains a bed of fluidized solid particulate material, a shielding region below said grate which, in operation, is occupied by a body of quiescent particulate material resting on the bottom of said housing, feed means for supplying solid particulate matter to said fluidized bed region, a freeboard region extending upward from said fluidized bed region to the top of said housing, a convection heat exchange chamber in horizontal communication with said freeboard region, a horizontally oriented steam drum extending through said freeboard region at the top thereof into the top of said convection heat exchange chamber, a horizontally oriented water drum extending across the bottom of said convection chamber, at least one water header below said grate in the reaction chamber, water-cooled walls being provided in said reaction chamber and said convection heat exchange chamber by tube and web panels, the vertically oriented tubes of said panels joining the water header or headers of said reaction chamber to said steam drum, convection bank tubes joining said water drum to said steam drum in said convection heat exchange chamber, a plurality of vertically oriented heat exchange tubes connected at the lower end thereof to said water header and passing through said shielding region below said grate, between adjacent sparge pipes of said grate and vertically upward into and through said fluidized bed region and said freeboard region to terminate in said steam drum, said heat exchanged tubes in said shielding region being isolated by said quiescent body of particulate material therein from the erosive conditions prevailing in said fluidized bed region, said heat exchange tubes being distributed in said reaction chamber so as to form a central firing aisle clear of heat exchanger tubes into which said feed means may introduce solid particulate fuel and other particulate feed, said sparge pipes being removably mounted in said housing and passing through said water-cooled walls, the tubes of said water-cooled wall in the region of penetration of said sparge pipes being splayed and of decreased diameter to accommodate passage of said sparge pipes, an air header located externally of said housing and horizontally connected to said sparge pipes, a plurality of air ports along the length of said sparge pipes for introduction of fluidizing air to fluidize the bed of particulate matter above said grate in said fluidized bed region, individually operable control means for each sparge pipe to open or close said sparge pipe to air flow, an exhaust stack communicating with said convection heat exchange chamber for exhausting combustion gases which have traversed said convection heat exchange chamber and an ash removal means communicating with said reaction chamber.

4,449,483

UNFIRED DRYING AND SORTING APPARATUS FOR PREPARATION OF SOLID FUEL AS A FEEDSTOCK FOR A COMBUSTOR

Charles Strohmeyer, Jr., Gladwyne, Pa., assignor to Electrodyne Research Corporation, Gladwyne, Pa.

Continuation-in-part of Ser. No. 456,586, Jan. 7, 1983, Pat. No. 4,442,796. This application Feb. 3, 1983, Ser. No. 464,062
Int. Cl.³ F22B *1/00*
U.S. Cl. 122—4 D **7 Claims**



1. An unfired drying and sorting apparatus for preparation of solid fuel for feed to the combustor of a steam generator comprising:

a vertical chamber;

a fluidized bed consisting of a mixture of sized moisture bearing particles of solid fuel and inert material;

a sorter at the base of said vertical chamber having a floor for supporting said fluidized bed within said vertical chamber;

a plenum located below and part of said sorter floor;

means including hot combustion gases produced by said steam generator combustor continuously furnishing unsaturated hot air/gas to said plenum;

ports in said sorter floor passing said hot air/gas from said plenum directionally and in a distributed pattern over said sorter floor fluidizing said mixture of sized particles of solid fuel and inert material and causing at least a portion of said mixture to migrate in a retraceable path, said unsaturated hot air/gas upflow through said bed removing moisture from said particles;

a first point in the periphery of said vertical chamber including means for adding a continuous supply of said sized particles to said bed for drying and sorting;

a second point in/at said sorter floor including means for removal of said inert particles;

a third point located at the top of said bed including means for removal and transport of said solid fuel particles to said steam generator combustor;

said second and third points located substantially downstream in said bed migrating retraceable path with reference to said first point providing retention time for said particles in said bed and causing particles from said first point in a fluidized state to flow to said second or third points selectively by virtue of particle density and over a period of time to facilitate separation;

a fourth point located at the outlet of said vertical chamber for removal of air/gas and water vapor;

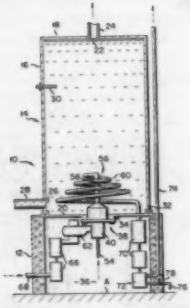
means connected to said forth point separating solid particles entrained in said air/gas and water vapor stream.

4,449,484

HOT WATER SUPPLY SYSTEM

Moriyoshi Sakamoto, and Toshihiko Saito, both of Yokohama, Japan, assignors to Tokyo Shibaura Denki Kabushiki Knisha, Kanagawa, Japan

Filed Nov. 26, 1982, Ser. No. 444,367
Claims priority, application Japan, Nov. 30, 1981, 56-192194
Int. Cl.³ F22B *5/00*
U.S. Cl. 122—13 R **16 Claims**



1. A hot water supply system comprising:

a base of a substantially cylindrical shape;

a storage tank supported on the base, the storage tank having an upper end plate and a lower end plate supported on the base and defining, together with an inner face of the base, a soundproofing chamber;

a pulse combustor including a pulse burner attached to the lower end plate and having a combustion chamber, and a tail pipe for discharging an exhaust gas which tail pipe communicates with the combustion chamber and is arranged inside the storage tank next to the lower end plate to function as a heat exchanger, the tail pipe having an ascending portion which extends upward from the pulse burner, said ascending portion having such a length that condensation of the exhaust gas does not occur in the ascending portion, and a descending portion which spirally extends from the topmost end of the ascending portion toward the lower end plate in such a manner that it is located around the ascending portion, said descending portion extending into the soundproofing chamber through the lower end plate to discharge water generated during combustion which condenses in the descending portion;

a blower arranged inside the soundproofing chamber to supply air to the pulse burner at an earlier stage of combustion;

a suction muffler arranged inside the soundproofing chamber and communicating with the blower;

an exhaust muffler arranged inside the soundproofing chamber and communicating with the descending portion of the tail pipe; and wherein

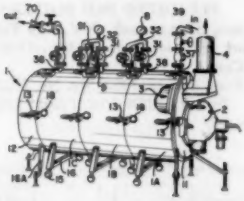
the base includes a soundproofing layer to shield noises generated in the soundproofing chamber.

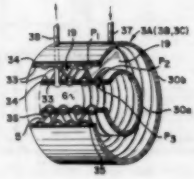
4,449,485

SEPARABLE COMBINATION BOILER

P. Lu-John Tan, No. 6, Hsia Yuan Rd., Ta Li Hsiang, Taichung Hsien, Taiwan

Filed Jul. 20, 1982, Ser. No. 400,121
Int. Cl.³ F22B *23/06*
U.S. Cl. 122—209 R **10 Claims**





1. A separable combination boiler comprising a boiler body including:

at least two horizontally aligned cylindrical boiler units each of which has in each end wall a central opening and a gas port above the central opening for the passage of combustion gases, and a front cover plate and a rear cover plate which are laid over the central opening in the front end wall of the foremost boiler unit and the central opening in the rear end wall of the rearmost boiler unit respectively, said boiler units and front and rear cover plates being separably joined together by fastening means provided thereon;

a heat exchanger contained within said boiler body and divided by said boiler units into an equal number of heat exchanging elements which are interconnected by tubes to allow an uninterrupted flow of heat-transfer medium therethrough;

a burner mounted on said front cover plate with its flame spout extending through a central opening in the front cover plate and the central opening in the front end wall of the foremost boiler unit;

a stack mounted on said boiler body and communicating with an exhaust port formed in one of said cover plates which faces the end of a combustion gas passage defined by said boiler body and heat exchanger;

wherein each heat exchanging element is constructed of at least one inner cylinder serving as a combustion chamber and one outer cylinder which are concentrically arranged within each boiler unit and spaced apart from each other by a helical plate surrounding the inner cylinder so as to form therebetween a helical passage for combustion gases, said helical passage extending from the gas port in one end wall of the boiler unit to the gas port in the other end wall thereof.

4,449,486

COOLING SYSTEM FOR WATER-COOLED ENGINES FOR VEHICLES

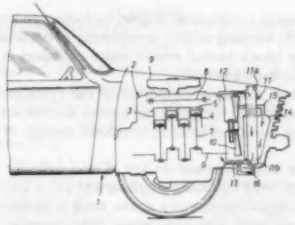
Chinei Kin, 2-13, Kotobuki-cho 2-chome, Higashi-Osaka-shi, Osaka-fu, Japan

Continuation-in-part of Ser. No. 446,026, Dec. 1, 1982, abandoned, which is a continuation-in-part of Ser. No. 214,133, Dec. 12, 1980, abandoned. This application Jun. 1, 1983, Ser. No. 498,682

Claims priority, application Japan, Jul. 8, 1980, 55-97337[U]

Int. Cl.³ F01D *3.18*

U.S. Cl. 123—41.29 **11 Claims**



1. A cooling system for a water-cooled, multicylindered, piston engine having a cooling water jacket for use in a land vehicle, the cooling system comprising a cooling water jacket having a cooling means including a cooling fan and a single radiator with an upper tank and a lower tank, an outlet pipe coupled between the radiator and the cooling water jacket for supplying cooling water from a lower portion of the lower tank to a lower portion of the cooling water jacket, an inlet pipe coupled between the cooling water jacket and the radiator for feeding cooling water from an upper portion of the cooling water jacket to an upper portion of the upper tank, at least one auxiliary tank in the form of a closed box containing cooling water capable of being circulated in parallel with the radiator, the tank being adapted to release heat to the atmosphere from its outer surface without a fan and having a capacity to selectively maintain the engine cooling water at a temperature of between about 30° C. to about 50° C. by selectively additionally using at least between about 15 to about 16 liters of cooling water in a parallel flow with the radiator selectively to afford an increased amont of cooling water in a flow to the water jacket when going up a slope, a lower communication pipe means connecting a lower portion of the auxiliary tank to the outlet pipe such that the cooling water in the lower communication pipe means flows into the outlet pipe and mixes with the cooling water in the outlet pipe, and an upper communication pipe means connecting the inlet pipe to an upper portion of the auxiliary tank such that a portion of the cooling water in the outlet pipe flows through the upper communication pipe means into the auxiliary tank, and wherein at least one of the upper and lower communication pipe means is provided with a water valve for selectively controlling the flow of cooling water therethrough when going up a slope, and said auxiliary tank is capable of being in parallel with the radiator so as to selectively circulate the cooling water from the cooling water jacket directly to the top of the radiator and then back to the cooling water jacket in a first cooling water path, and also from the cooling water jacket to the top of the box and then back to the cooling water jacket in a second cooling water path.

4,449,487

INTERNAL-COMBUSTION ENGINE HAVING LUBRICATING AND COOLING OIL CIRCUITS

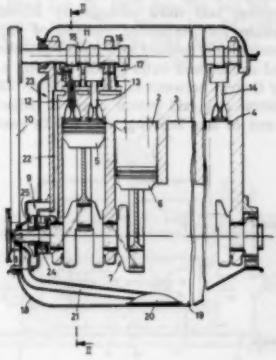
Hermann Krüger, and Hermann Deutsch, both of Wolfsburg, Fed. Rep. of Germany, assignors to Volkswagenwerk AG, Wolfsburg, Fed. Rep. of Germany

Filed Nov. 18, 1981, Ser. No. 322,723

Claims priority, application Fed. Rep. of Germany, Nov. 27, 1980, 3044603

Int. Cl.³ F01P *1/06, 3/12*

U.S. Cl. 123—41.34 **13 Claims**



1. An internal combustion engine comprising in combination:

(a) an oil reservoir;

(b) a lubricating oil circuit being in communication with and including said oil reservoir;

(c) a lubricating oil pump in said lubricating oil circuit for drawing oil from said oil reservoir and driving the oil in said lubricating oil circuit;

(d) a cooling oil circuit being in communication with and including said oil reservoir;

(e) a cooling oil pump in said cooling oil circuit for drawing oil from said oil reservoir with the circumvention of said lubricating oil pump and driving the oil in said cooling oil circuit; said cooling oil pump having a lower output pressure than said lubricating oil pump; and

(f) engine components being in communication with said cooling oil circuit for exposure to oil driven by said cooling oil pump in said cooling oil circuit.

4,449,488

FREE PISTON INTERNAL COMBUSTION ENGINE

William C. Heaton, Decatur, Ga., assignor to Rondal P. Howell, Brewton, Ala., a part interest

Division of Ser. No. 157,517, Jun. 9, 1980, Pat. No. 4,344,288. This application Jul. 20, 1982, Ser. No. 400,071

Int. Cl.³ F02B *71/00*

U.S. Cl. 123—46 R **4 Claims**

1. A reciprocating piston apparatus for an internal combustion engine, comprising:

a housing defining a cylindrical piston chamber and having

a first end and a second end, said housing defining through the cylindrical wall thereof a first vaporized fuel opening adjacent to said first end of said housing, and a second vaporized fuel opening adjacent to said second end of said housing;

an outer cylindrical piston having a first end and a second end, fitted within said housing for reciprocal movement, said outer piston defining a first annular channel in the cylindrical surface thereof, a first interior cylindrical cavity therein, and a first passageway connecting said first annular channel and said first interior cavity;

an inner cylindrical piston fitted within said interior cavity of said outer piston for reciprocal movement, said inner piston defining a second interior cavity therein, a second annular channel in the cylindrical surface thereof, a second passageway connecting said second annular channel to said second interior cavity and first valve means for alternately providing a passageway between said second interior cavity and said first interior cavity of said outer piston at alternate ends of said inner piston;

said first end of said outer piston defining a third passageway therein between said first interior cavity of said outer piston and said piston chamber adjacent to said first end of said housing, said third passageway including second valve means for permitting passage of vaporized fuel therethrough only toward said piston chamber;

said second end of said outer piston defining a fourth passageway therein between said first interior cavity of said outer piston and said piston chamber adjacent to said second end of said housing, said fourth passageway including third valve means for permitting passage of vaporized fuel therethrough only toward said piston chamber;

said first end of said housing defining a first exhaust opening therein including fourth valve means for selectively opening and closing said first exhaust opening;

said second end of said housing defining a second exhaust opening therein including fifth valve means for selectively opening and closing said second exhaust opening;

first ignition means for selectively igniting vaporized fuel between said first end of said outer piston and said first end of said housing; and

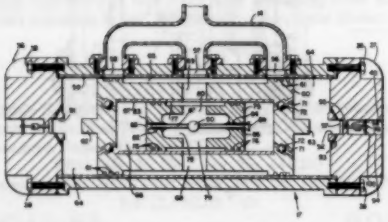
second ignition means for selectively igniting vaporized fuel between said second end of said outer piston and said second end of said housing;

said first vaporized fuel opening in said housing communicating with said piston chamber between said first end of said outer piston and said first end of said housing, and said second vaporized fuel opening communicating with said first annular channel in said outer piston, when said outer piston moves toward said second end of said housing;

said second vaporized fuel opening communicating with said piston chamber between said second end of said outer piston and said second end of said housing, and said first vaporized fuel opening communicating with said first annular channel in said outer piston, when said outer piston moves toward said first end of said housing;

and

said first passageway defined by said outer piston communicating with said second annular channel of said inner piston.

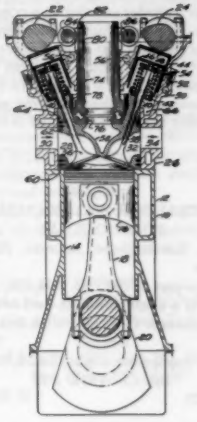


4,449,489

VARYING GEOMETRIC COMPRESSION RATIO ENGINE

Gerald J. Williams, R.R. #2, Nolalu, Ontario, Canada (POT 2KO)

Filed May 21, 1981, Ser. No. 266,086
Int. Cl.[3] F02B 75/04
U.S. Cl. 123—48 R 66 Claims



1. An internal combustion engine, including geometric compression ratio varying means, comprising in combination

a cylinder block having one or more cylinders in a row,

a piston in each cylinder,

a crankshaft rotatably supported in the cylinder block and connected with the piston or pistons to convert the reciprocating motion of same to rotational motion of the crankshaft,

a cylinder head disposed on top of said cylinder bank, said cylinder head including a cylindrical valve carrier cavity, coaxial with and directly above each cylinder of the said cylinders, and communicating downwardly with said cylinder, said cylindrical valve carrier cavity defining a shallow bore in diameter approximately equal to the diameter of said cylinder and further including one lateral intake port means communicating with said cylindrical valve carrier cavity and air and fuel intake means, and lateral exhaust port means communicating with said cylindrical valve carrier cavity and an exhaust means, and further including a jackscrew support means, coaxial with and in line with each said cylindrical valve carrier cavity,

one or two camshafts carried in said cylinder head for rotation on an axis parallel with the axis of the said crankshaft, said camshaft or camshafts being driven in timed relation with the movement of the piston or pistons,

a valve carrier disposed in each said cylindrical valve carrier cavity, and to thereby close the top of the said cylinder, said valve carrier defining a cylindrically machined casting closely matching the said cylindrical valve carrier cavity in diameter, and reciprocatably, within limits, disposed within said cavity and prevented from rotation within same, said valve carrier including ports communicating with said cylinder and the respective said intake port means and the said exhaust port means in the said cylinder head, and poppet valves movable to control the opening and closing of said ports, said poppet valves being spring biased towards the closed position,

valve actuating means between said camshaft or camshafts and said poppet valves for actuating said valves in timed relation with the motion of the piston or pistons, said valve actuating means including a means to continuously eliminate play between the lobes on said camshaft or

camshafts and the ends of the stems of said poppet valves during reciprocation of said valve carrier,

a jack screw, carried by said jackscrew support means and engageable with said valve carrier on a seating surface located coaxially, said jack screw defining a hollow cylinder, threaded over some length to match thread in said jack screw support means, said threads engaging so that upon rotation of said jack screw, in either direction, said jack screw will either move up or down, said jack screw also rotatably engaging said valve carrier in a manner so that upon rotation of said jack screw in either direction, within limits, said valve carrier will either move up or down within limits, said jack screw including a jack screw drive means,

a jack screw power actuation means defining a means engageable with said jack screw drive means to rotate same in either direction within limits,

a jack screw power actuation control means, operatively connected with said power actuation means, and defining a control which will determine the gas charge mass admitted into the cylinder or cylinders during each combustion cycle and which will direct the operation of said jack screw power actuation means according to pre-programmed instructions,

an ignition means,

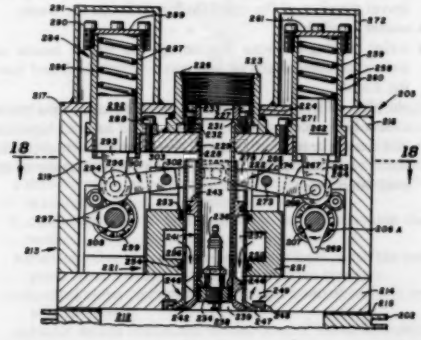
whereby an engine is provided in which the geometric compression ratio is varied to compress the gas charge to identical or nearly identical absolute pressure values regardless of the quantity of the gas charge mass admitted during each combustion cycle, during all or most of the power output range.

4,449,490

CONCENTRIC INTAKE AND EXHAUST VALVE ASSEMBLY

Craig N. Hansen, Minnetonka, Minn., assignor to Hansen Engine Corporation, Minnetonka, Minn.

Filed May 19, 1982, Ser. No. 379,637
Int. Cl.³ F01L *1/28*
U.S. Cl. 123—79 C **23 Claims**



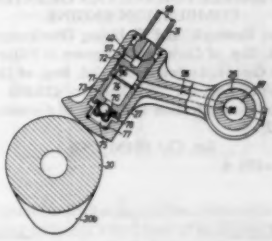
1. An internal combustion engine comprising: a block having at least one cylindrical wall surrounding a combustion chamber, a piston means located in said combustion chamber, means operable to reciprocate the piston means in said chamber, a head means mounted on the block covering said chamber, said head means having an air and fuel intake passage and an exhaust gas passage, an intake and exhaust valve assembly mounted on the head means for controlling a flow of air and fuel into the chamber and a flow of exhaust gas from the combustion chamber, said valve assembly having an exhaust gas valve movably mounted on the head means for movement between an open position and a closed position for controlling the flow of the exhaust gas from the combustion chamber and an intake valve concentrically located relative to the exhaust gas valve movable to an open position and a closed position, a tubular member having a passage, means mounting the tubular member on the head means to align the tubular member with the combustion chamber, a spark plug mounted on the tubular member and located in said passage, said spark plug having electrodes exposed to the combustion chamber, said intake valve including a sleeve slidably mounted about the tubular member, an annular outwardly directed flange secured to the sleeve, said exhaust gas valve having an annular rim surrounding and engageable with the flange when the intake valve is closed, and means operable to sequentially move the intake valve and exhaust gas valve between their open and closed positions in timed relation with the movement of the piston means whereby said engine has an intake, compression, power, and exhaust strokes.

4,449,491

LUBRICATING DEVICE FOR INTERNAL COMBUSTION ENGINE

Tadashi Tsuchiyama, and Yoshiaki Hidaka, both of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 26, 1982, Ser. No. 342,785
Claims priority, application Japan, Jan. 30, 1981, 56/12648; Jan. 30, 1981, 56/12649; Feb. 9, 1981, 56/17811
Int. Cl.³ F01M *1/06, 9/10*
U.S. Cl. 123—90.34 **7 Claims**



1. In a lubricating system for an internal combustion engine having intake and exhaust valves and a valve operating device for the intake and exhaust valves mounted on the engine body, the improvement comprising, in combination: a cam shaft turnably mounted in bearing means supported on the engine body, the cam shaft having an oil passage formed therein in communication with said bearing means, a cam on said cam shaft, a rocker arm shaft mounted on the engine body and having an oil passage therein, a rocker arm turnably mounted on the rocker arm shaft and having contacting means engaging said cam, an oil pump adapted to be driven by said engine, an oil chamber formed in the engine body and communicating with said oil pump, a first oil path connecting said oil chamber to said oil passage in the cam shaft, and a second oil path connecting said oil chamber to said oil passage in the rocker arm shaft, whereby lubricating oil supplied from said oil pump is fed independently to the cam shaft and to the rocker arm shaft by way of said first and second oil paths, respectively.

4,449,492

ATTACHMENT FOR A HEAT SHIELD

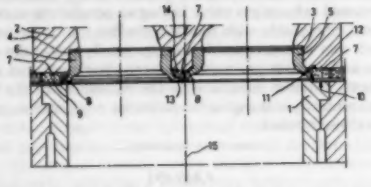
Jean-Paul Reynaud, St. Georges d'Esperanche, France, assignor to Renault Vehicules Industries, Lyon, France

Filed Jul. 8, 1982, Ser. No. 396,445
Claims priority, application France, Jul. 10, 1981, 81 13612
Int. Cl.³ F02F *1/26*
U.S. Cl. 123—193 CH **3 Claims**

1. In a cylinder head of a combustion engine having at least one bore for a valve seat insert, a first surface defining a portion of a combustion chamber, and a valve seat insert including

an annular peripheral rim, one said insert being fixed in each said bore, a heat shield comprising:

a flat plate formed of a heat insulating material, said plate including an aperture for each said valve seat insert, said plate being positioned on said first surface and having a first portion held between said first surface and each said rim,



wherein said cylindrical head is connected to an engine cylinder via an elastic gasket, wherein an edge portion of said heat shield is elastically held between said gasket and said first surface, and wherein said first portion of said heat shield is fixed to said cylinder head solely by said insert being fixed in said bore.

4,449,493

SLOSH BAFFLE FOR OIL PAN OF INTERNAL COMBUSTION ENGINE

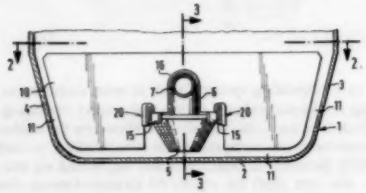
Eduard Kopec, Remseck, and Wolfgang Oberknapp, Marbach, both of Fed. Rep. of Germany, assignors to Filterwerk Mann & Hummel GmbH, Ludwigsburg, Fed. Rep. of Germany

Filed Aug. 23, 1982, Ser. No. 410,698

Claims priority, application Fed. Rep. of Germany, Aug. 21, 1981, 8124422[U]

Int. Cl.³ F01M *1/00*

U.S. Cl. 123—196 A **9 Claims**



1. In an internal combustion engine, particularly of the in-line type as used in automotive vehicles, which engine has an oil suction strainer arranged centrally near the bottom of its elongated oil pan and a substantially horizontally extending oil suction line connected to the top of the strainer by means of an elbow, in such an engine, a slosh baffle assembly for the stabilization of the oil level against longitudinal flowoff to either oil pan extremity comprising in combination:

a slosh baffle in the form of a panel extending substantially vertically and transversely to the oil pan, so as to form narrow flow gaps with the walls of the oil pan, thereby subdividing the latter into two oil chambers linked by said flow gaps;

a saddle portion extending substantially horizontally from the slosh baffle so as to engage the elbow of the oil suction line from above, to secure the transverse orientation of the slosh baffle;

a substantially horizontal peripheral rim on the upper end of the oil suction strainer; and

means for attaching the slosh baffle to the rim of the oil suction strainer at multiple circumferentially spaced points, to secure the vertical position of the slosh baffle.

4,449,494

INTERNAL COMBUSTION ENGINE

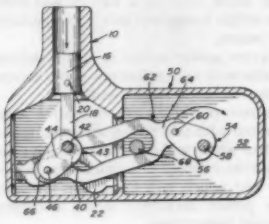
Normand Beaudoin, Le Gardeur, Canada, assignor to Compagnie du Moteur Energitique C.M.E. Inc., Quebec, Canada

Continuation-in-part of Ser. No. 436,823, Oct. 26, 1982, abandoned. This application Feb. 7, 1983, Ser. No. 464,144

Claims priority, application Canada, Oct. 29, 1981, 389266

Int. Cl.³ F02B *75/32*

U.S. Cl. 123—52 A **5 Claims**



1. In an internal combustion engine:

a block;

a series of pistons reciprocally displaceable in said block along respective axes;

a connecting rod for each piston, each said rod having one end attached to an associated piston and the opposite end having an enlarged portion defining a track therein; said track extending laterally of the displacement axis of said piston;

a plurality of individual crankshafts rotatably mounted in said block, each crankshaft having throw means cooperatingly engaging an associated track and being displaceable therein; each said track having a shape including a curved portion which causes reduction of loss of power into the respective crankshafts on said connecting rod for a given travel distance of the crankshaft element in the track;

a master crankshaft;

a series of single levers connecting the throw means of individual crankshafts to said master crankshaft and having a slot;

a plurality of pivot means for each lever, each said pivot means being mounted to said block and located between said master crankshaft and its associated individual crankshaft, each said pivot means biasing the operation of its associated lever.

4,449,495

ENGINE WITH AUTOMATIC CUT-OFF DEVICE

Ernst Fiala, Wolfsburg, Fed. Rep. of Germany, assignor to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Fed. Rep. of Germany

Filed Jul. 6, 1981, Ser. No. 281,231

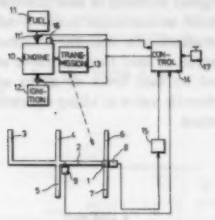
Claims priority, application Fed. Rep. of Germany, Jul. 5, 1980, 3025539

Int. Cl.³ F02B *75/12*

U.S. Cl. 123—198 DB **7 Claims**

1. In a vehicle having an internal combustion driving engine, a manually operated transmission connectable to the driving

engine, and a shift lever for controlling the manually operable transmission and having a neutral position, the improvement



comprising a control device responsive to placing of the shift lever in the neutral position to cut off the driving engine.

4,449,496

CYLINDER-NUMBER-CONTROLLED ENGINE

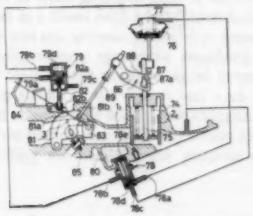
Hiroichi Mokuya; Masao Yokko, both of Shizuoka; Hiroyuki Komatsu, Hamamatsu; Katsuhisa Suzuki, Hamana, and Takeo Kitayama, Shizuoka, all of Japan, assignors to Suzuki Motor Company Limited, Japan

Filed Aug. 28, 1981, Ser. No. 297,178

Claims priority, application Japan, Sep. 10, 1980, 55-125546; Dec. 2, 1980, 55-169763; Dec. 4, 1980, 55-171395; May 29, 1981, 56-82034

Int. Cl.³ F02D *17/02*

U.S. Cl. 123—198 F **9 Claims**



1. In an engine having a plurality of cylinders, with a manifold pipe for an air fuel mixture flow to the cylinders and a plurality of intake pipe connected between the manifold pipe and each cylinder respectively, the improvement comprising;

a throttle valve movably mounted in the manifold pipe from a closed position to an open position;

a cam connected to said throttle valve and movable therewith;

a control valve movably mounted in at least one of the intake pipes from a closed position to an open position;

a control valve rod connected to said control rod and movable therewith;

actuator means connected to said control valve for instantaneously opening said control valve to a selected open position, said actuator means operatively connected to said throttle valve from its closed position, said selected open position being less than a fully open position of said control valve, said actuator means comprising a vacuum actuator having a pressure chamber bounded by a movable element which is connected to said control valve rod, and switching means connected to said vacuum actuator and operatively engaged with said throttle valve cam, for communicating said pressure chamber with one of the intake pipes to establish a partial vacuum in said pressure chamber and instantaneously open said control valve;

linkage means connected between said throttle valve and said control valve for causing movement of said control valve beyond said selected open position with movement of said throttle valve beyond a selected open position thereof, said means comprising a linkage rod connected to said cam, a pivotably mounted linkage lever connected to said linkage rod having a slot therein and pivotable with movement of said throttle valve, and a pin connected to said control valve rod and disposed in said slot for movement of said control valve only after movement of said throttle valve beyond said selected open position of said throttle valve; and

throttle valve drive means connected to said position.

4,449,497

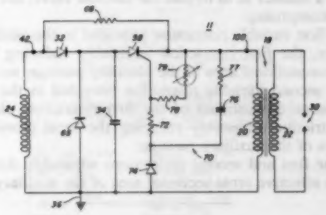
CAPACITOR DISCHARGE IGNITION SYSTEM

Ronald J. Wolf, Zanesville; Richard F. Jereb, Fort Wayne, and Mark Farmer, Farmersburg, all of Ind., assignors to Wabash, Inc., Huntington, Ind.

Filed Jul. 23, 1982, Ser. No. 401,232

Int. Cl.³ F02P *9/00*

U.S. Cl. 123—335 **15 Claims**



1. In a capacitor discharge ignition system for use with and for positioning adjacent a flywheel of an engine that generates a rotating magnetic field provided by a permanent magnet carried by the flywheel, the combination of:

means for generating in response to each passage of the permanent magnet and in operative sequence a charging supply and a triggering supply in response to induced voltages and currents resulting from the rotating magnetic field, said generating means comprising a control winding;

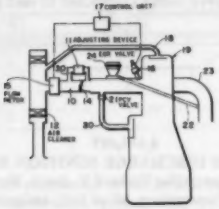
ignition coil means for receiving energy and for generating an ignition voltage in response to received energy; and

means responsive to said generating means and being charged in response to said charging supply for storing said energy delivered from said charging supply and for controlling the discharge of said stored energy into said ignition coil means, said storing and discharge controlling means comprising engine speed control means for inhibiting the charging of said storing and discharge controlling means when the speed of the engine exceeds a predetermined speed, said storing and discharge controlling means comprising electronic switch means having a control connection, said engine speed control means comprising resistive-capacitive circuit means being connected to said triggering supply and said control connection for rendering said electronic switch means conductive to discharge said stored energy into said ignition coil means when the speed of the engine is less than said predetermined speed and for maintaining said electronic switch means conductive when the speed of the engine exceeds said predetermined speed from one revolution of the flywheel to the next revolution of the flywheel and from one occurrence of said triggering supply throughout at least the duration of the next occurrence of said charging supply.

4,449,498
IDLE-ADJUSTING DEVICE FOR AN INTERNAL COMBUSTION ENGINE

Tomofusa Horiuchi, Yokohama, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Sep. 29, 1982, Ser. No. 428,707
Claims priority, application Japan, Dec. 7, 1981, 56-182014
Int. Cl.³ F02B 3/00; F02D 9/02; F02M 25/06
U.S. Cl. 123—339 5 Claims



1. An idle-adjusting device for an engine having an air intake passage, a throttle valve disposed in the air intake passage, and an auxiliary passage communicating with the air intake passage in such a manner as to bypass the throttle valve, the adjusting device comprising:

(a) a first variable restriction provided in the auxiliary passage, the first restriction adjustably reducing the local cross-sectional area of the auxiliary passage; and

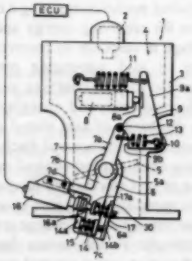
(b) a second variable restriction provided in the auxiliary passage downstream of the first restriction, the second restriction adjustably reducing the local cross-sectional area of the auxiliary passage;

(c) the first and second restrictions adjustably determining the effective cross-sectional area of the auxiliary passage.

4,449,499
FUEL INJECTION SYSTEM

Shoji Ito, Aichi, Japan, assignor to Aisan Kogyo Kabushiki Kaisha, Obu, Japan

Filed Dec. 16, 1982, Ser. No. 450,226
Claims priority, application Japan, Jan. 21, 1982, 57-7881[U]
Int. Cl.³ F02D 11/10, 1/04; F02M 1/12, 3/00
U.S. Cl. 123—339 3 Claims

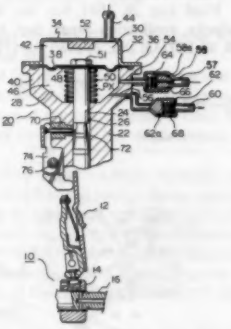


1. In combination with a fuel injection system having a fuel cut mechanism for detecting an idling condition of an engine by an idle switch and for stopping fuel supply at the idling condition in response to the engine condition such as engine temperature and engine speed, the improvement comprising a body thereof, a thermo-sensitive element fixed outside of said body and adapted to expand and contract in response to the engine temperature, a cam provided outside of said body and adapted to rotate in response to expansion and contraction of said thermo-sensitive element, an air intake passage provided inside of said body, a throttle valve provided inside of said air intake passage and rotatably fixed to said throttle shaft, a lever rotatably supported by said throttle shaft and carrying an idle switch thereon, said idle switch being maintained at on-condition through angular moment of said throttle shaft in its closed direction when an acceleration pedal is released, said lever being rotated in association with the rotation of said cam with the opening degree of said throttle valve at idling operation being controlled by said lever so as to adjust the opening degree of said throttle valve at idling operation to suit with the engine temperature.

4,449,500
INJECTION COMPENSATOR FOR FUEL INJECTION PUMP

Hisatsugu Kawatei; Hidetoshi Saito, and Hisashi Nakamura, all of Matsuyama, Japan, assignors to Diesel Kiki Company, Ltd., Tokyo, Japan

Filed Jun. 7, 1982, Ser. No. 385,607
Claims priority, application Japan, Jun. 5, 1981, 56-86573
Int. Cl.³ F02D 23/02
U.S. Cl. 123—380 5 Claims



1. An injection compensating apparatus for a fuel injection pump which includes a plunger or piston, a control sleeve movably coupled over the plunger, and a tension lever rotatably about a pin in operative connection with the control sleeve comprising:

a housing mounted on the pump;

a pressure sensitive member dividing the interior of the housing into a first chamber and a second chamber, the first chamber being communicated to variable atmospheric and boost pressures;

constant pressure maintaining means for maintaining a pressure inside the second chamber at a substantially constant reference level;

the constant pressure maintaining means comprising a first check valve and a second check valve through which the second chamber is communicated to a source of vacuum supply and to the atmosphere, respectively, the first check valve opening when a pressure in the second chamber is higher than the reference level while the second check valve opening when the pressure is lower than the reference level; and

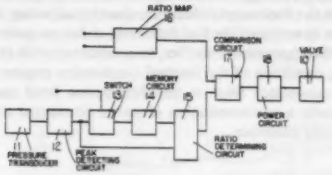
a cam and follower mechanism for operative connection between the pressure sensitive member and the tension lever;

whereby the pressure sensitive member controls a position of the control sleeve through the cam and follower mechanism and the tension lever in response to a pressure differential between the first and second chambers.

4,449,501
DEVICE FOR ADJUSTING ENGINE TIMING

Godfrey Greeves, Hatch End, England, assignor to Lucas Industries Limited, Birmingham, England

Filed Nov. 24, 1981, Ser. No. 324,601
Claims priority, application United Kingdom, Dec. 31, 1980, 8041548
Int. Cl.³ F02P 5/04
U.S. Cl. 123—425 6 Claims



1. An engine system comprising a reciprocating piston engine means for feeding fuel to the engine, means operable to effect an adjustment of the commencement of fuel injection in a diesel engine or ignition timing in a spark ignition engine, pressure transducer means for providing an electrical signal representative of the peak pressure attained within a combustion space of the engine, means for providing a signal representing the desired peak pressure, said last named means being provided with information relative to the engine speed and the fuel quantity, and means for comparing said signals, the output of said comparing means acting as a control signal for the means operable to effect an adjustment of the commencement of fuel injection in a diesel engine or ignition timing in a spark ignition engine and said pressure transducer means including a ratio determining circuit, means for supplying to the ratio determining circuit a peak pressure signal obtained during a fueled working stroke of the engine and a no fuel pressure signal obtained at an instant during a working stroke when no fuel is in the combustion chamber, said means for providing a signal representing the desired peak pressure comprising a ratio map.

4,449,502
CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINE

Toshio Furuhashi, Mito, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 11, 1981, Ser. No. 301,132
Claims priority, application Japan, Sep. 12, 1980, 55-126089
Int. Cl.³ F02M 7/12
U.S. Cl. 123—440 13 Claims

1. A control system for an internal combustion engine comprising:

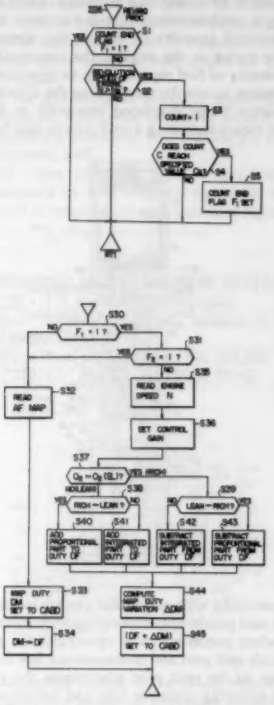
counting means for accumulating a count value in synchronism with a rotation of the engine from a time when the engine starts, wherein said counting means accumulates said count value only when the engine speed exceeds a predetermined value;

displaying means set when the accumulated value of said counting means reaches a predetermined value;

electrically controlled valve means provided in at least one of an air and fuel supplying system to control the air/fuel ratio of a fuel-air mixture being supplied to the engine;

a sensor provided in an exhaust system of the engine to generate an output signal proportional to an oxygen concentration in the exhaust gas of the engine; and

control units for supplying to said electrically controlled valve means a control output signal in response to the output signal from said sensor after said display means is



set, and a control output signal independent of the output signal from said sensor before said display means is set.

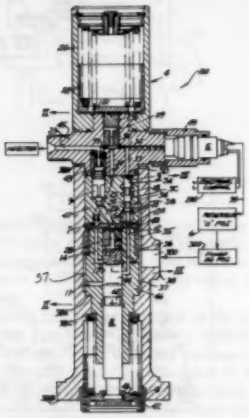
4,449,503
FUEL INJECTION PUMP

Douglas A. Luscomb, Mt. Upton, N.Y., assignor to The Bendix Corporation, Southfield, Mich.

Continuation-in-part of Ser. No. 276,608, Jun. 28, 1981, Pat. No. 4,422,424. This application Sep. 22, 1982, Ser. No. 421,606
Int. Cl.³ F02M 39/00
U.S. Cl. 123—447 6 Claims

1. In a fuel injection pump for supplying pressurized fuel to an engine, and of the type having a housing assembly provided with an internal bore defining a pressure chamber having an inlet/outlet port for receiving and discharging fuel and a metering chamber having an inlet for receiving a metered quantity of fuel and an outlet for discharging pressurized fuel, a plunger connectably driven by the engine for reciprocation in the pressure chamber, a floating piston movably disposed within said bore in spaced relation to the plunger, a control valve chamber located within said housing assembly and having a first port communicating with the pressure chamber port a second port communicating with the metering chamber inlet and a drain outlet, a valve member movable within the control valve chamber between seated and unseated positions, an accumulator pressurized by reciprocation of the plunger to provide high pressure fuel to the pump, the accumulator providing fuel to the control valve chamber and to the metering chamber and having a recess for receiving a sufficient amount of pressurized fuel, a pilot valve adapted to be energized and de-energized to selectively establish first and second states of

flow for communicating fuel between the accumulator and the control valve chamber the energized state causing the valve member to be seated and the deenergized state causing the valve member to be unseated, a normally closed delivery valve operable by a predetermined pressure to open and communicate the metered quantity of fuel in the metering chamber through the outlet to the engine, the communication of the metered quantity of fuel representing an injection phase of the pump operation, means for terminating the injection phase as a result of piston being displaced upwardly in the bore, said termination means including a spill port in said housing assem-



bly communicating with an annular groove in said housing and passages in said piston communicating with metering chamber such that when piston is driven upwardly, the passages communicate with spill port and communicate fuel from the metering chamber to the spill port whereupon the predetermined pressure in metering chamber falls and delivery valve closes, thereby terminating injection of fuel to the engine, the improvement characterized by:

a normally closed check valve communicating with said spill port and operable by a predetermined pressure to open and allow escape of residual fuel from said metering chamber following said injection phase.

4,449,504

DISTRIBUTOR TYPE FUEL INJECTION PUMP

Yasuhiro Furuhashi; Yukinori Miyata, both of Kariya, and Osamu Hishinuma, Susono, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Mar. 29, 1983, Ser. No. 480,129

Claims priority, application Japan, Mar. 31, 1982, 57/46277[U]

Int. Cl.³ F02M *59/20*

U.S. Cl. 123—447 **9 Claims**

1. A distributor type fuel injection pump for injecting high-pressure fuel into each combustion chamber of an internal combustion engine, comprising:

a pump housing defining a low-pressure fuel supply chamber therein;

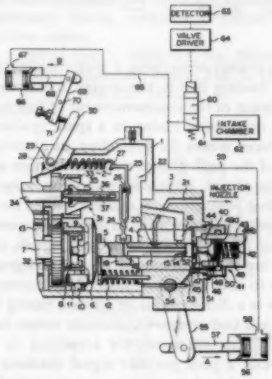
a distribution head coupled to the pump housing and having as many discharge ports as cylinders in the internal combustion engine;

a pump cylinder housed in the distribution head and defining a fuel compression chamber therein;

a plunger fitted into the pump cylinder, so as to be able to reciprocate and rotate in synchronism with the operation of the internal combustion engine and having a distribution groove thereon, said distribution groove being selectively connected to each of the discharge ports and communicating with the fuel compression chamber, whereby the fuel is sucked from the fuel supply chamber into the fuel compression chamber, to be pressurized therein for each stroke of the plunger, and the high-pressure fuel is injected from a specified discharge port into the combustion chamber of the internal combustion engine as the distribution groove is connected to the specified discharge port in accordance with the rotation position of the plunger;

injection quantity adjusting means opening with a given timing a passage connecting the fuel compression chamber and the fuel supply chamber, thereby adjusting the injection quantity of the fuel delivered under pressure from the fuel compression chamber, in accordance with the operating condition of the internal combustion engine;

an accumulator fixed to the distribution head and having therein a communication chamber connected to the fuel supply chamber,



said accumulator including:

cylinder means having a piston and defining therein an accumulation chamber capable of being connected to the fuel compression chamber, and

a spring housed in the communication chamber and urging with a fixed force the piston in the direction to reduce the capacity of the accumulation chamber;

a valve disposed in a passage connecting the fuel compression chamber, the accumulator and the fuel supply chamber so that the accumulator is prevented from operating when the valve is closed; and

compensating means for opening the valve in at least one of the states in which the internal combustion engine is in low-speed rotation and in which said engine is in low-load operation and for compensating the operation of the injection quantity adjusting means so that the fuel injection quantity is increased to a predetermined degree.

4,449,505

INTERNAL COMBUSTION ENGINE

Etsuhiro Tezuka, Hamamatsu; Koichiro Kaji, Iwata, and Toru Ichinose, Fukuroi, all of Japan, assignors to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Continuation-in-part of Ser. No. 839,360, Oct. 4, 1977 and Ser. No. 854,260, Nov. 23, 1977, both abandoned. This application Mar. 8, 1978, Ser. No. 884,410

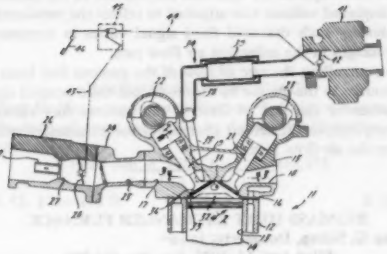
Claims priority, application Japan, Mar. 12, 1977, 52-27429

Int. Cl.³ A02B *15/00*; **F02B** *13/00*

U.S. Cl. 123 **55 Claims**

1. In an internal combustion engine having a variable volume chamber in which combustion occurs and a main intake passage communicating with said chamber through a main intake port for delivering a charge therethrough, the charged deliv-

ered to said chamber through said main intake port from said main intake passage being substantially unrestricted, the improvement comprising a sub-intake passage communicating with said combustion chamber through a sub-intake port, said sub-intake passage having an effective cross-sectional area substantially less than the effective cross-sectional area of said main intake passage for causing a given mass flow of charge through said sub-intake port to enter said chamber at a significantly greater velocity, said sub-intake port and said sub-intake passage being oriented so that its discharge is in a different direction than the discharge from said main intake passage and for effecting a swirl of the charge entering said chamber through said sub-intake port of sufficient magnitude to be



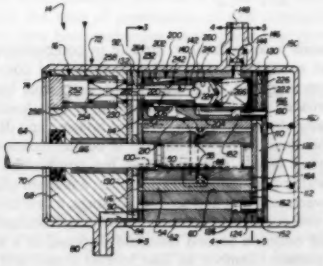
maintained during the induction and compression strokes, and valve means for controlling the ratio of the communication of said ports with said chamber during a given cycle operation of said engine, said valve means being effective to cause a substantial portion of the load requirements of the chamber to be supplied through one of said intake passages at a certain running condition so that the flow generated by that passage predominates the flow pattern in said chamber during that running condition and a substantial portion of the charge requirements of the chamber at another running condition to be supplied through the other of said intake passages so that the flow generated by that intake passage predominates the flow pattern in said chamber during that other running condition.

4,449,506

FUEL SUPPLY SYSTEM

Gilbert H. Drutchas, Birmingham, Mich., assignor to TRW Inc., Cleveland, Ohio

Filed Nov. 25, 1981, Ser. No. 324,689
Int. Cl.³ F02D *5/02*; F02M *51/00*
U.S. Cl. 123—458 **16 Claims**



3. Apparatus for delivering fuel to an engine, said apparatus comprising

a fuel pump driven by the engine,

an outlet conduit means for directing fuel from said pump to the engine,

means for providing an electrical signal indicative of the fuel flow to be delivered from said pump to the engine,

a control valve for controlling the fuel flow through said outlet conduit means to the engine in response to said electrical signal when said means for providing an electrical signal is functioning and in response to changes in pump speed upon failure of said means for providing an electrical signal,

said means for providing an electrical signal comprising a microprocessor, and sensor means for sensing at least one engine operating parameter and providing a signal to said microprocessor, and

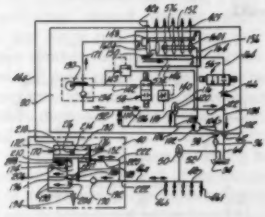
said control valve including a valve spool and solenoid means actuated by said electrical signal for moving said valve spool in response to said electrical signal.

4,449,507

DUAL PRESSURE METERING FOR DISTRIBUTOR PUMPS

Endre A. Mayer, Birmingham, Mich., assignor to The Bendix Corporation, Southfield, Mich.

Filed Dec. 17, 1980, Ser. No. 217,312
Int. Cl.³ F02B *3/00*; F02M *59/42*
U.S. Cl. 123—467 **27 Claims**



1. A fuel injection system for a diesel engine having an injector and metering modes of operation for delivering fuel from a fuel reservoir to the cylinders of a engine comprising:

a plurality of fuel injectors wherein each of said fuel injectors comprise:

a housing having a first port (**45**) adapted to receive fuel at a first determinable pressure level, a second port (**47**) adapted to receive fuel at a second determinable pressure level and a nozzle (**194**), and further having metering chamber means (**186**) connected to said second port, for storing a premetered quantity of fuel, during the metering mode of operation, prior to the injection of said premetered quantity of fuel into the engine during the injection mode of operation;

piston means (**170**) responsive to the differential fuel pressure applied thereacross having a first pressure receiving surface (**176**) in fluid communication with said first port and a second pressure receiving surface (**188**) in fluid communication with said second port for reciprocatively moving within said housing or selectively compressing and for causing said premetered quantity of fuel to exit said metering chamber means and to be injected into said engine, through said nozzle, during the injection mode and for selectively permitting fuel to reenter said metering chamber means during a subsequent metering mode;

manifold means for connecting in fluid communication each of second ports of each of said fuel injector;

pressure regulating means connected between said manifold means and the fuel reservoir for regulating and for supplying fuel at said second determinable pressure to said second inlet port of each of said injectors and for returning to the reservoir excess fuel received from said injectors;

distributor pump means connected to the said first port of each of said fuel injectors and to the fuel reservoir for sequentially pressurizing said first port of a particular fuel

injector at a pressure greater than the pressure established by said pressure regulating means causing said piston to stabilize at the bottom of its stoke and sequentially thereafter lowering said first pressure level to a pressure lower than that of the pressure established by said pressure regulating means thereby causing said piston to move causing said premetered quantity of fuel to enter said metering chamber means of a particular one of said fuel injectors through said second port and for sequentially thereafter increasing said first pressure level thereby causing said piston to pressurize the fuel within said metering chamber means to initiate fuel injection into the engine through said nozzle.

4,449,508

ELECTRICALLY CONTROLLED OR REGULATED FUEL METERING SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

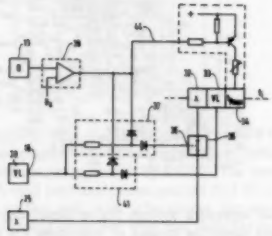
Otto Glöckler, Renningen; Dieter Günther, Murr; Michael Horbelt, Schwieberdingen, and Ulrich Steinbrenner, Stuttgart, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Sep. 13, 1982, Ser. No. 416,995

Claims priority, application Fed. Rep. of Germany, Oct. 8, 1981, 3139988

Int. Cl.³ F02B *3/00*

U.S. Cl. 123—492 **13 Claims**



1. In an electronically controlled fuel metering system for controlling control variables upon the instance of a full-load condition for an internal combustion engine having one sensor means each for the air flow in an intake tube of said engine and for the position of a throttle valve of said engine, comprising a signal generating means for generating a full-load signal in accordance with a logical linkage of signals from said sensor means for said air flow and said throttle valve position.

4,449,509

GASEOUS FUEL CARBURETION

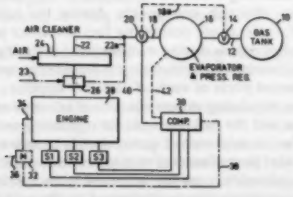
Colin G. Young, Mississauga, Canada, assignor to Emco Wheaton (International) Limited, London, Canada

Filed Apr. 23, 1982, Ser. No. 371,469

Claims priority, application Austria, May 1, 1981, PE8679

Int. Cl.³ F02B *43/00*

U.S. Cl. 123—527 **6 Claims**



1. In a gaseous fuel carburetion system in which air and gaseous fuel are mixed prior to induction into an internal combustion engine, and in which the rate of flow of the induction air is controlled by throttling the intake of the air/fuel mixture, and in which gaseous fuel is supplied to the system from a pressurized source, an improved method of regulating the supply of gaseous fuel to the engine comprising the steps of;

(a) sensing the speed of rotation of said engine and generating a first control signal which is a measure of the displaced volume rate of the engine in use,

(b) sensing the pressure in the induction manifold and generating a second control signal which is a measure of the density of the air induced by the engine which varies according to the load applied to the engine,

(c) combining said first and second control signals to generate a third control signal which is measure of the amount of fuel required for optimum combustion of the measured displaced volume rate adjusted to reflect the measured air density such that said third signal varies in response to changes in the induction air flow rate,

(d) controlling the rate of flow of the gaseous fuel from the source to the engine by means of said third control signal whereby the rate of flow of the gaseous fuel varies in response to the sensed changes in the parameters related to the air flow rate.

4,449,510

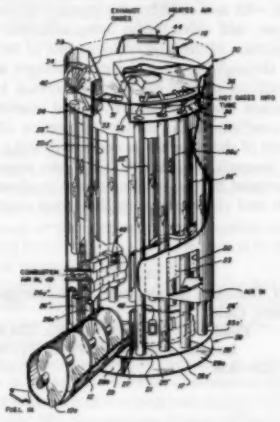
BIOMASS HEAT EXCHANGER FURNACE

Eugene G. Sukup, Dougherty, Iowa

Filed Apr. 14, 1983, Ser. No. 484,981

Int. Cl.³ F24H *3/00*

U.S. Cl. 126—99 A **13 Claims**



1. A biomass heat exchanger furnace in combination with biomass fuel receiving means and a biomass fuel conveying means connecting said receiving means with said heat exchanger furnace; said furnace comprising a first housing; a second housing disposed within said first housing and defining a combustion chamber having an inlet in communication with said conveying means and an outlet for combustion gases generated within said combustion chamber; a plenum chamber formed between said first and second housings; a first manifold disposed at one end of said plenum chamber and communicating with said outlet; a second manifold disposed at a second end of said plenum chamber; an inlet formed in said first housing and communicating with said plenum chamber for a gaseous fluid; an outlet formed in said first housing and communicating with said plenum chamber and spaced substantially from said inlet for the gaseous fluid; means for circulating the gaseous fluid through said plenum chamber; means defining a plurality of passageways for the combustion gases disposed

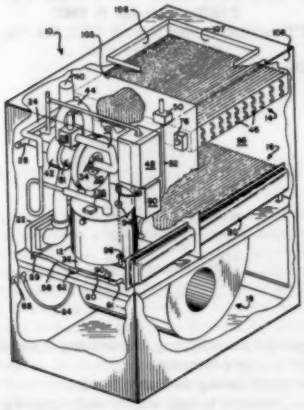
within said plenum chamber and interconnecting said first and second manifolds whereby the combustion gases flow successively between said manifolds and are in heat exchange relation with the gaseous fluid circulating through said plenum chamber; vent means formed in said first housing and in communication with said passageways whereby the combustion gases are discharged from the furnace subsequent to having successively flowed through said passageways and said manifolds; and means for causing said combustion gases to flow through said manifolds, passageways and vent means.

4,449,511

RECUPERATIVE FURNACE

Herbert G. Hays, Amana, and Warren W. Kuipers, Cedar Rapids, both of Iowa, assignors to Amana Refrigeration, Inc., Amana, Iowa

Filed Jan. 6, 1983, Ser. No. 456,172
Int. Cl.³ F24H 3/02
U.S. Cl. 126—110 R **8 Claims**



1. A forced air furnace, comprising:

means for combusting fuel;

a first heat exchanger positioned in thermal communication with the heat of combustion of said combusting means, said first heat exchanger transferring heat from said heat of combustion to a fluid;

a second heat exchanger;

means for recirculating said fluid between said first and second heat exchangers;

a third heat exchanger communicating with said combusting means wherein products of combustion from said combusting means are passed through said third heat exchanger;

an air blower having its output coupled to said third heat exchanger for preheating said air from thermal transfer from said products of combustion and from heat of condensation resulting from a portion of said products of combustion condensing within said third heat exchanger; and

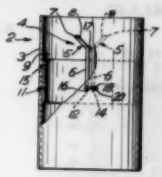
said preheated air from said third heat exchanger being coupled to said second heat exchanger for thermal transfer from said fluid.

4,449,512

ENERGY EFFICIENT DAMPER FOR A FURNACE

Alfred Hebert, Skidmore Rd., Pleasant Valley, N.Y. 12569

Filed Jan. 26, 1982, Ser. No. 342,817
Int. Cl.³ F23L 3/00
U.S. Cl. 126—292 **3 Claims**



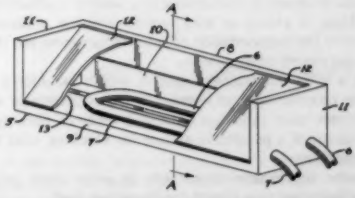
1. A damper for sealing and unsealing a vertical furnace exhaust flue pipe to minimize the escape of heat when the furnace is not operating, said damper comprising a cylindrical body adapted to form a section of vertical flue pipe having inner and outer walls, said cylindrical body having a top opening and a bottom opening, at least one transverse hinge rod horizontally transversing said body carried by opposed apertures in opposing wall portions of the body, an annular rim mounted on the inner wall of the body, a pair of oppositely extending gull-wing shaped damper shutters pivotably mounted on said hinge rod, each of said pair of gull-wing shaped damper shutters having a lower section and an outer upper section, said outer upper section further including upper and lower surfaces, and outer and lower edges, and in the closed condition the lower sections of the shutters extending upwardly and outwardly at approximately a 45° angle and the outer upper sections of the shutters extending horizontally to slightly spaced from the inner wall of the damper section, the lower edges of the outer upper sections engaging said annular rim so as to prevent the lower edges from becoming wedged against the inner wall of the damper section, said gull-wing shaped damper shutters opening to a vertical position when said furnace is operating and closing by gravity when said furnace is not operating.

4,449,513

SOLAR HEATER

George Lover, 4773 Beach Ridge Rd., Lockport, N.Y. 14094

Filed Aug. 2, 1983, Ser. No. 519,681
Int. Cl.³ F24J 3/02
U.S. Cl. 126—416 **20 Claims**

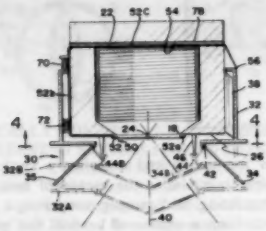


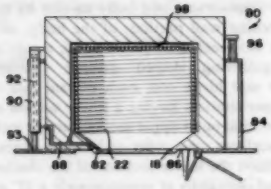
1. A solar heater for swimming pool water comprising a heat exchange housing, water inlet means, and water outlet means, said housing elements comprising insulated end portions, an insulating back portion, an insulating base portion, and a diagonally disposed glass facing, said elements forming an elongated triangular structure, positioned within said housing is sheet metal plate in contact with said back portion and said base portion, positioned on and in heat contact with said metal plate is at least one of said water inlet and outlet means, said water outlet means continuous with said inlet means and adapted to permit water flow into it from said inlet means.

4,449,514
SOLAR CONCENTRATOR PROTECTIVE SYSTEM

M. Kudret Selcuk, La Canada, Calif., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Jun. 25, 1982, Ser. No. 392,103
Int. Cl.³ F24J 3/02
U.S. Cl. 126—418 8 Claims





1. In a solar concentrator system which includes a solar radiation receiver with an opening and a concentrator which concentrates solar radiation onto said receiver opening, the improvement of a protective system for blocking solar radiation comprising:

a shutter mechanism including at least one shutter, said mechanism moveable between open and closed configurations; and

means for storing said shutter mechanism near said receiver and in an open configuration to avoid blocking the receiver opening, and for moving said shutter mechanism toward said concentrator to a second position spaced from said receiver opening by at least about the width of said receiver opening, as measured along an imaginary centerline that connects the middle of said concentrator and said receiver opening, and closing said shutter mechanism and holding it closed at said second position, whereby to reduce the concentration of solar radiation on the shutter in the closed configuration.

2. In a solar concentrator system which includes a solar radiation receiver with an opening and a concentrator which concentrates solar radiation onto said receiver opening, the improvement of a protective system for blocking solar radiation comprising:

a shutter mechanism releaseable to move from an open configuration to a closed configuration; and

means for releasing said shutter mechanism including a wire having a fuse portion extending around the receiver opening so the fuse portion can be broken by concentrated sunlight falling thereon, and means responsive to breaking of said fuse portion for releasing said shutter mechanism to move to said closed configuration.

6. In a solar concentrator system which includes a solar radiation receiver with an opening and a concentrator which concentrates solar radiation onto said receiver opening, the improvement of a protective system for blocking solar radiation comprising:

a shutter mechanism including at least one shutter, said mechanism moveable between open and closed configurations; and

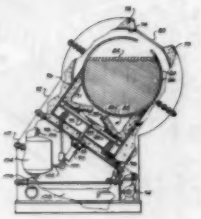
means for storing said shutter mechanism near said receiver and in an open configuration to avoid blocking the receiver opening, and for moving said shutter mechanism toward said concentrator to a second position and closing said shutter mechanism and holding it closed at said second position;

said shutter mechanism includes a shutter frame moveable toward said concentrator and a plurality of shutter elements pivotally mounted on said frame to pivot between open and closed positions, each element including a cam follower, said shutter mechanism also including a plurality of cams mounted on said receiver and positioned to pivot said cam followers to close said shutter elements as said frame moves toward said concentrator.

4,449,515
APPARATUS FOR COLLECTING, INTENSIFYING AND STORING SOLAR ENERGY

Jack E. Nilsson, Sr., Easley, S.C., assignor to Seige Corporation, Greenville, S.C.

Continuation-in-part of Ser. No. 57,733, Jul. 16, 1979, Pat. No. 4,280,482.
PCT No. PCT/US81/00293, § 371 Date Jul. 9, 1982, § 102(e) Date Jul. 9, 1982
This PCT application filed Mar. 9, 1982, Ser. No. 425,071
Int. Cl.³ F24J 3/02
U.S. Cl. 126—430 7 Claims



1. An apparatus for collecting, intensifying or sustaining, and storing solar energy comprising:

a hollow vessel having an interior wall;

a window provided in said wall of said vessel for allowing concentrated rays from the sun to enter into the interior of said vessel;

a solar collector carried adjacent the center of said vessel spaced from the interior walls of said vessel, said solar collector including;

(i) a container,

(ii) a substantially black fluid heat absorbing surface positioned for being contacted by said rays passing through said window,

(iii) heat absorbing means carried in said container supporting said substantially black fluid heat absorbing surface for absorbing and storing thermal energy from said heat absorbing surface and for heating said container causing radiant energy to be emitted from said container, and

(iv) said heat absorbing means being metal that goes from a solid state to a liquid state upon absorbing thermal energy from said substantially black heat absorbing surface, and

a polished reflective surface carried on an interior wall of said vessel for reflecting radiant energy back to said container intensifying the temperature of said heat absorbing means.

4,449,516

SUNLIGHT-ENERGY-STORING METHOD

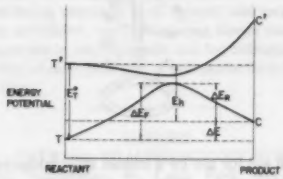
Teijiro Kitao, Tondabayashi; Jun-ichiro Setsune, Sakai; Shoichi Ishihara, Katano, and Ryoichi Yamamoto, Neyagawa, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Jan. 25, 1983, Ser. No. 460,897

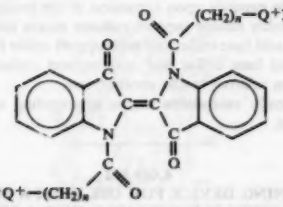
Claims priority, application Japan, Jan. 29, 1982, 57-13910

Int. Cl.³ F24J *3/02*

U.S. Cl. 126—430 **7 Claims**



1. A method for storing sunlight energy, which comprises exposing an indigo derivative whose trans-isomer has the stuctural formula:



wherein n is zero or an integer of 1 or larger; X^- is a monovalent anion; and Q is a nitrogen-containing heterocyclic ring system comprising at least one member selected from the group consisting of a pyridyl group, a pyridazinyl group, a pyrimidinyl group, a pyrazinyl group, an N-alkylimidazolyl group, an N-alkylpyrazolyl group, an oxazolyl group, an isoxazolyl group, a thiazolyl group, an isothiazolyl group, a quinolyl group, an isoquinolyl group, a cinnolinyl group, a quinoxalinyl group an N-alkylbenzimidazolyl group, a benzoxazolyl group, a benzisoxazolyl group, a benzthiazolyl group, a benzisothiazolyl group, an N-alkylindazolyl group, an α-naphthoquinolyl group, a β-naphthoquinolyl group, an acridinyl group, a naphthyridinyl group, a phenazinyl group, a purinyl group, a phenanthrolinyl group, a 4,4-bipyridyl group, a 2,2-bipyridyl group and derivatives of the above-mentioned groups to sunlight in order to convert the trans-isomer into the cis-isomer, thus storing the aforesaid sunlight energy, and liberating the aforesaid collected energy as heat by the addition of a catalyst and/or a heat trigger.

4,449,517

SOLAR HEAT PLANT

Tatsuo Tani; Sinji Sawata; Tadayoshi Tanaka; Koichi Sakuta, all of Ibaraki; Yasunobu Nakamoto, Yokohama; Hideshi Sekiya; Masanobu Morita, both of Tokyo, and Norio Yamagata, Tomakomai, all of Japan, assignors to Agency of Industrial Science and Technology, Tokyo and Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, both of, Japan

Filed Mar. 5, 1982, Ser. No. 355,093

Claims priority, application Japan, Mar. 13, 1981, 56-35392

Int. Cl.³ F24J *3/02*

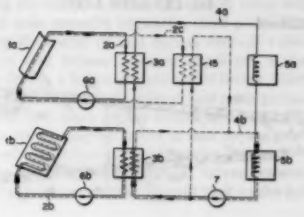
U.S. Cl. 126—435 **10 Claims**

1. A solar heat plant comprising:

a first system including a first heat collector for changing solar energy to high temperature heat energy under usual sunshine and to low temperature heat energy under poor sunshine to supply said heat energy to a first medium;

a first heat load which works under usual sunshine using said heat energy supplied to the first medium;

a second system including a second heat collector for changing solar energy to low temperature heat energy under



usual or poor sunshine to supply said heat energy to a second medium; and

a second heat load which works under usual sunshine using said heat energy supplied to the second medium and also works under poor sunshine using said heat energies supplied to the first and second media.

4,449,518

DISINFECTION INDICATOR FOR MEDICAL EQUIPMENT

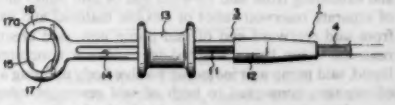
Yutaka Konomura, and Yasuhiko Omagari, both of Tokyo, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Apr. 2, 1982, Ser. No. 364,972

Claims priority, application Japan, Apr. 13, 1981, 56-55407; Apr. 13, 1981, 56-55408; Apr. 13, 1981, 56-55409; Apr. 13, 1981, 56-55410; Apr. 13, 1981, 56-55411

Int. Cl.³ A61B *17/00;* **G01L** *5/00;* **G01K** *1/02*

U.S. Cl. 128—4 **10 Claims**



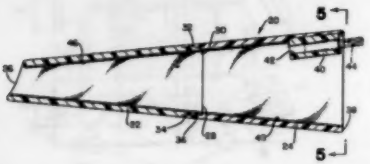
1. A disinfection indicator mounted on medical equipment which is repeatedly used after thermal sterilization, comprising a deformable portion made of a shape memory alloy having a one-way shape memory effect, which is deformable plastically by an external force exerted as a result of use of the medical equipment, from a shape indicating disinfection of the medical equipment to an initial deformed shape which it has when the medical equipment is in use, said deformable portion being modified from the initial deformed shape to the shape indicating disinfection of the medical equipment when the medical equipment is heated to a temperature higher than a predetermined temperature, whereby it can be determined whether or not the medical equipment has been used by the shape of the deformable portion.

4,449,519

ENDOSCOPE

Robert J. Sarrine, Ann Arbor, Mich., assignor to Transidyne General Corporation, Ann Arbor, Mich.

Continuation of Ser. No. 190,528, Sep. 24, 1980, Pat. No. 4,350,147. This application May 17, 1982, Ser. No. 378,468
The portion of the term of this patent subsequent to Sep. 21, 1999, has been disclaimed.
Int. Cl.³ A61B 1/00
U.S. Cl. 128—4 6 Claims



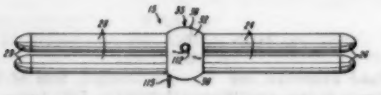
1. An endoscope (20) comprising means defining a hollow, conical cylinder divided into multiple sections (22), (24), each section being detachably connected to (30), (32)–(36) adjacent sections whereby said means provides endoscopes of various lengths and of different size openings (26), (34) for use in engaging a presenting part (16) at different stages in the birth process.

4,449,520

PENILE PROSTHESIS DEVICE

Juan M. Palomar, 10 Southmoor Cir., NW., Kettering, Ohio 45429, and Gary M. Bird, 510 Glenn Ave., New Carlisle, Ohio 45344

Filed Sep. 2, 1982, Ser. No. 414,568
Int. Cl.³ A61F 5/00
U.S. Cl. 128—79 6 Claims



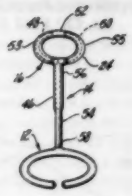
1. A penile prosthesis device adapted to be implanted in the right and left corpora cavernosa to provide for a mechanical erection, said device comprising a pump unit adapted to be implanted at the base of the penis transecting the medial corporal septum, said pump unit having a forward end and a rearward end, a pair of separate erecting tubes of flexible material and extending from said forward end of said pump unit, a pair of separate reservoir tubes of flexible material and extending from said rearward end of said pump unit, said erecting and reservoir tubes being adapted to receive a noncompressible liquid, said pump unit including a valve body defining a first set of passages connected to both of said reservoir tubes and a second set of passages connected to both of said erecting tubes, said pump unit defining an inlet passage extending from said first set of passages and adapted to be connected to an auxiliary liquid supply container located within the scrotum, a set of one way valves located within said first and second sets of passages, laterally actuating pump means effective to pump liquid from said reservoir tubes and said inlet passage through said first set of passages to said second set of passages and said erecting tubes for pressurizing said erecting tubes in response to the application of squeezing pressure laterally to opposite sides of the penis at the base, a return passage connecting said first and second sets of passages, and said pump unit including a pressure release valve within said return passage and effective to release the pressure of the liquid within both said erecting tubes for return of the liquid to both said reservoir tubes through said first and second set of passages.

4,449,521

SEXUAL AID

Jack S. Panzer, 12930 Denmark, Detroit, Mich. 48217

Continuation-in-part of Ser. No. 300,301, Sep. 11, 1981, abandoned. This application Sep. 30, 1982, Ser. No. 430,996
Int. Cl.³ A61F 5/00
U.S. Cl. 128—79 7 Claims



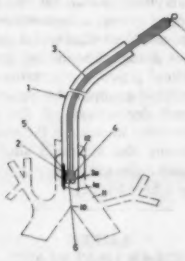
1. A sexual aid for use by a human male comprising:
a base collar;
a support collar comprising an arcuate member having two free ends spaced apart from one another and a flexible tube attachable to said two free ends and forming a complete ring whereby said support collar is adjustable to accomodate penises of varying thicknesses and said flexible tube expands upon expansion of the penis;
an adjustably fixable support column means interposed between said base collar and said support collar for maintaining said base collar and said support collar in a fixed position relative to one another; and
an elastically extendable means surrounding said support column.

4,449,522

POSITIONING DEVICE FOR USE WITH A TRACHEAL TUBE WHICH IS INSERTABLE INTO A PERSON'S TRACHEA FOR RESPIRATION PURPOSES

Marcel Baum, Vienna, Austria, assignor to Drägerwerk A.G., Fed. Rep. of Germany

Filed May 7, 1982, Ser. No. 376,156
Claims priority, application Fed. Rep. of Germany, May 19, 1981, 3119854
Int. Cl.³ A61M 16/00
U.S. Cl. 128—200.26 6 Claims



1. A positioning device for use with a tracheal tube which is insertable into a person's trachea particularly one of the type having a respirator gas jet discharge which must be positioned relative to a carina of the trachea, comprising an elastic measuring probe adapted to be inserted into the tracheal tube and having a distal end which is adapted to be pushed out of an end of the tracheal tube when the tracheal tube is in the trachea, a carina engaging stop end portion foldably mounted on said distal end of said probe and adapted to be brought into contact with the carina, said measuring probe having an opposite end adapted to extend out of the tube and the person's trachea, said opposite end including means for manipulating said stop end

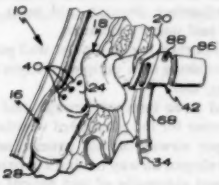
portion so that said distal end can be accurately engaged on the carina, said probe having a length greater than said tracheal tube and at least as great as the length of the trachea from the person's mouth to the carina, said carina engaging stop portion comprising a pair of foldable and unfoldable substantially straight arms, and said manipulating means comprising a connecting member engaged with said arms, extending through said elastic probe and being manipulatable from the outside of the probe at the opposite end thereof to unfold said foldable and unfoldable sections, said foldable arms forming an inverted V-shaped crown for engaging the carina when they are unfolded and being disposed back against said measuring probe when they are folded, and a measuring sleeve mounted on said measuring probe at said opposite end for indicating an amount of projection of said distal end of said probe from the end of the tracheal tube.

4,449,523

TALKING TRACHEOSTOMY TUBE

Edward H. Szachowicz, St. Louis Park, and John Walsh, LaCrescent, both of Minn., assignors to Implant Technologies, Inc., Edina, Minn.

Filed Sep. 13, 1982, Ser. No. 417,727
Int. Cl.³ A61M *16/00*
U.S. Cl. 128—200.26 **13 Claims**



1. In a tracheostomy tube for insertion through an incision in the neck of a patient and into the trachea to support breathing including a cannula having a first end for placement within the trachea for directing air or oxygen towards the lungs of the patient and a second end located outside of the trachea and the neck of the patient for receiving air or oxygen, and first means for sealing between the cannula and the trachea for substantially preventing air or oxygen from escaping from the first end of the cannula upward in the trachea towards the larynx, with the improvement comprising means for allowing the patient utilizing a tracheostomy tube to phonate comprising, in combination: second means for introducing air or oxygen above the first sealing means in the trachea for movement towards the larynx of the patient; and third means comprising an annular member positioned on said cannula such as to be located within the annular space between the cannula and the stoma of the patient for sealing between the cannula and the stoma of the patient for preventing the air or oxygen introduced by the second means from escaping through the stoma in the neck of the patient around the cannula of the tracheostomy tube.

4,449,524

SELF-CONTAINED BREATHING APPARATUS WITH PROVISION FOR SHARED USE

Robert E. Gray, Clearwater, Fla., assignor to Litton Systems, Inc., Frederica, Del.

Filed Mar. 15, 1982, Ser. No. 358,504
Int. Cl.³ A62B *7/04*
U.S. Cl. 128—202.27 **3 Claims**

1. A self-contained breathing apparatus comprising, an air tank containing a supply of highly compressed air and adapted for carriage on the person of a user of the system;

a modular housing containing

(1) a main shut-off valve,

(2) a main pressure regulator,

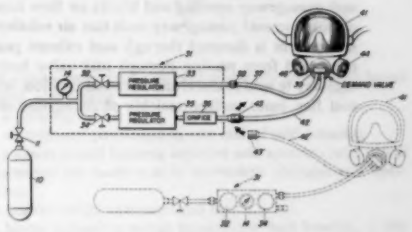
(3) a bypass shut-off valve and

(4) a bypass pressure regulator;

an air tank hose connecting said air tank to said housing for supplying high pressure air thereto,

said housing including first conduit means for supplying air received from said tank hose to the inlets of said main and said bypass shut-off valves, second conduit means connecting the outlet of said main shut-off valve with the inlet of said main pressure regulator, third conduit means connecting the outlet of said bypass shut-off valve with the inlet of said bypass pressure regulator, a main supply outlet fitting, a bypass supply outlet fitting, fourth conduit means connecting the outlet of said main pressure regulator with said main supply outlet fitting and fifth conduit means connecting the outlet of said bypass pressure regulator with said bypass supply outlet fitting,

said main and said bypass shut-off valves respectively controlling the flow of air from said tank to the inlets of said



main and said bypass pressure regulators, said main and said bypass pressure regulators respectively regulating the high pressure of air received from said main and bypass shut-off valves to a first substantially constant moderate pressure and to a second substantially constant pressure substantially below said first moderate pressure, said modular housing being adapted for carriage on the body of a user of the system;

a face mask;

a demand valve mounted on said face mask, said demand valve controlling the pressure and flow of air released therefrom in accordance with the requirements of a user of the system;

a main supply hose connecting said main supply outlet fitting with the inlet of said demand valve; and

a bypass supply hose for connecting bypass supply outlet fitting with the interior of said face mask;

said bypass supply outlet being of the manually operable, quick connect/disconnect type.

4,449,525

PULMONARY RESUSCITATOR

Daniel S. White, Rte. 1, Box 25A, Sunrise Beach, Mo. 65079, and Jerald L. Nave, P.O. Box 414, Oak Grove, Mo. 64110

Filed Feb. 8, 1981, Ser. No. 232,652
Int. Cl.³ A61M *16/00*
U.S. Cl. 128—203.11 **12 Claims**

1. A pulmonary resuscitator for use by a single rescuer administering artificial respiration to a patient while simultaneously administering an external cardiac massage to the patient including:

(a) an elongate air tube means having a first end and a second end and defining an airflow passage therethrough between said ends;

(b) a mouthpiece attached to said first end of said air tube means adapted to communicate with the mouth of the rescuer;

(c) patient air flow means attached to said second end of said air tube means, said air flow means providing communica-

tion between the lungs of the patient and said air tube means and including securing means to hold said air flow means to said patient so as to free the hands of a rescuer;

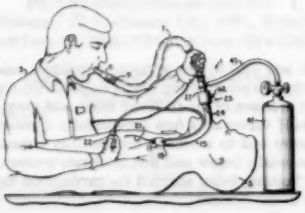
(d) bipositional valve means positioned within said air tube means intermediate said first and second ends and near said second end, said valve means including:

(1) a valve body having an inner chamber therein, said chamber communicating through said air tube means with said patient air flow means;

(2) a passageway interconnecting said chamber with said air tube means and said mouthpiece and defining an opening leading into said chamber;

(3) an exhaust port through said valve body and communicating said chamber with ambient air surrounding said valve body;

(4) a butterfly flap positioned within said valve body and including an outer surface and an inner surface; said flap being alternatively positionable between a first position, wherein said flap outer surface sealably abuts against said passageway opening and blocks air flow from said chamber to said passageway such that air exhaled from said patient is directed through said exhaust port and prevented from passing through said valve body passageway to said rescuer, and a second position, wherein said flap inner surface sealably abuts against said exhaust port such that air exhaled by said rescuer passes through said chamber of said air tube means to the lungs of said patient and is prevented from exiting said exhaust port;



(5) hinge means connecting said flap to said valve body and maintaining said flap within the air flow stream passing through said valve body such that reciprocal breathing motivates said flap to rotate between said first and second positions; and

(6) positional means for maintaining said flap within the air flow stream passing through said valve body such that a directional change in the air flow stream motivates said flap to rotate from one of said flap positions to the other of said flap position; and

(e) a compressed oxygen tap adapted to be connected to a compressed oxygen source and communicating freely and without restriction with said air flow passage of said air tube means to provide continuous flow from said compressed oxygen source to said airflow passage; said tap being located near said valve means and said tube means being valveless between said tap and said mouthpiece so as to allow continuous filling of said tube means through said tap; said air tube means providing a reservoir for said oxygen between said mouthpiece and said tap; and said air tube means providing substantially unrestricted and free flow of said oxygen between said mouthpiece and said tap.

4,449,526

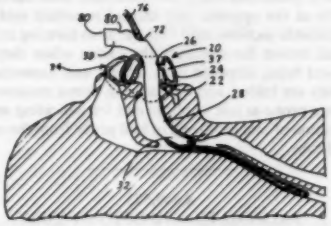
MASK BREATHING SYSTEM

James O. Elam, 1822 Canelo St., Dallas, Tex. 75323

Filed Nov. 27, 1981, Ser. No. 325,259

Int. Cl.³ A61M *16/00*

U.S. Cl. 128—206.21 **43 Claims**



21. A mouth mask, comprising:

a unitary member having an inner wall portion, said inner wall portion being adapted to seal about the lips of a patient by resting on the perioral area overlying the maxilla and mandible, said unitary member including an outer wall portion spaced outwardly of said inner wall portion;

an opening extending through said inner and outer wall portions of said unitary member;

said inner wall portion and said outer wall portion connected to each other along their peripheral edges and the edges of said opening; and

a tube adapted to be inserted through said opening in said unitary member for the purpose of ventilating and managing the upper airway of said patient, said tube being a generally S-shaped airway having a proximal end adapted to be disposed externally of said patient and a distal end adapted to be disposed internally of said patient in the region of the lower pharynx, said generally S-shaped airway having a generally straight intermediate portion with oppositely curved proximal and distal end portions, said generally S-shaped airway having a hole in said curved proximal end portion and a hole in said curved distal end portion, said holes being substantially aligned with said straight intermediate portion, and including a sump tube adapted to be passed through said holes for guided insertion into the esophagus of said patient.

4,449,527

ENDOTRACHEAL TUBE HOLDER

Deborah L. Hinton, 225 Virginia Dr., Hueytown, Ala. 35023

Filed Oct. 21, 1981, Ser. No. 313,623

Int. Cl.³ A61M *25/02*

U.S. Cl. 128—207.17 **18 Claims**

1. An endotracheal tube holder for securing an endotracheal tube within a patient's mouth comprising:

(a) a clamping means of variable diameter for permitting the securement of any one of a plurality of endotracheal tubes

of different diameter in a patient's mouth without rotation of the tube with respect to said clamping means, said clamping means having a cylindrical section with an axis of rotation, an interior surface which is variable in diameter for securement to any one of said endotracheal tubes of different diameter, an exterior cylindrical surface whereby the thickness of the clamping means is minimized, a cut in said cylindrical section extending generally axially with respect to said axis of rotation of said cylindrical section to form first and second ends which may be displaced circumferentially from each other with respect to said axis of rotation of said cylindrical section and means for adjusting the circumferential displacement of the first and second ends from each other to permit clamping of said endotracheal tubes which range in diameter and first and second attachment means which are respectively attached to opposed sections of the exterior cylindrical surface for permitting securement of a strap to said exterior cylindrical surface of said cylindrical section, and

(b) a strap having at least first and second ends, the first and second ends each respectively having first and second end attachment means which are respectively attachable to and detachable from the first and second attachment means, the width of the first and second end attachment means of the first and second ends in proximity to the patient's mouth being equal to or less than the outside diameter of the cylindrical section so as to not occlude access to and visualization of the patient's mouth.

4,449,528

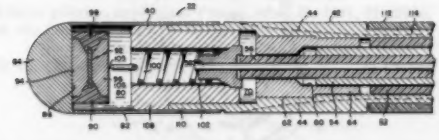
FAST PULSE THERMAL CAUTERY PROBE AND METHOD

David C. Auth, Bellevue; Dale M. Lawrence, Lynnwood, and Tim R. Majoch, Tacoma, all of Wash., assignors to University of Washington, Seattle, Wash.

Continuation-in-part of Ser. No. 131,897, Mar. 20, 1980, abandoned. This application Jul. 20, 1981, Ser. No. 285,366

Int. Cl.³ A61B *17/36*

U.S. Cl. 128—303.1 **30 Claims**



1. An apparatus for heating tissue without causing deep tissue damage, comprising:

an electrically powered thermal probe having a heating element and an active heat-transfer portion which is in direct thermal contact with said heating element so that heat is transferred to said heat-transfer portion principally by conduction, said heat-transfer portion having a unit heat capacity of less than 1 joule/°C. to allow said probe to cool from a temperature sufficiently high to coagulate within a sufficiently short period to prevent excessive heat penetration; and

power-generating means connected to the heating element of said probe applying an electric current pulse to said heating element during a heating cycle having sufficient energy to allow said probe to coagulate tissue during said heating cycle.

4,449,529

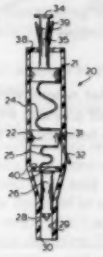
AUTOMATIC RETRACTABLE LANCET ASSEMBLY

James A. Burns, Elizabeth, and Edward L. Nugent, N. Caldwell, both of N.J., assignors to Becton Dickinson and Company, Paramus, N.J.

Filed Nov. 18, 1981, Ser. No. 322,345

Int. Cl.³ A61B *17/34*

U.S. Cl. 128—314 **13 Claims**



1. A throw-away single use automatically retractable lancet assembly, comprising

(a) a housing;

(b) an aperture positioned in one end of said housing;

(c) a lancet in said housing adjacent said aperture, said lancet mounted for reciprocable movement through said aperture;

the improvement characterized by

(d) lancet actuating means mounted in said housing in the end thereof opposite said aperture;

(e) a first spring mounted in said housing and positioned between said lancet actuating means and said lancet;

(f) said first spring being movable from a first compressed position to a second relaxed position upon release to cause movement of said lancet outward through said aperture for penetration of the skin of a patient;

(g) means for dissociating said first spring in said second position from further movement of said lancet;

(h) said lancet actuating means movable through said housing end from a first non-charge position to a second charge position for moving said first spring from a relaxed state to a compressed state;

(i) release means in said housing for retaining said first spring in said first position and for the release of said first spring to cause the said movement thereof from said first position to said second position for causing outward movement of said lancet through said aperture;

(j) a second spring positioned between and connecting said first spring and said lancet;

(k) said second spring being movable from a first relaxed position maintained at both the non-charged and charged position of said actuating means with said lancet withdrawn from said aperture;

(l) to a momentarily extended condition momentarily thrusting said lancet through said aperture back to a relaxed position with the lancet withdrawn from the aperture.

4,449,530

HEMOSTATIC CLIPS AND METHOD OF MANUFACTURE

Lee P. Bendel, Lebanon, and Timothy Sardelis, Somerset, both of N.J., assignors to Ethicon, Inc., Somerville, N.J.

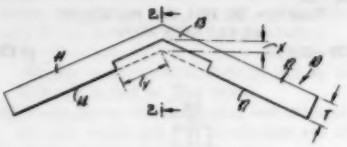
Filed Jul. 15, 1981, Ser. No. 283,692

Int. Cl.³ A61B *17/12, 17/00*

U.S. Cl. 128—325 **6 Claims**

1. A metal hemostatic clip comprising a pair of leg members connected at their proximal ends by a thinned hinge area, said hinge area being at least from 8% to 30% thinner than the thickness of a leg member and said thinned area being slightly

wider than and extending a distance along each leg member from the proximal end thereof towards the distal end thereof a distance of from ½ to 3 times the thickness of a leg member, said



distance being such that whereby on closing of the clip, the clip bends in the thinned area and when the clip is closed there is substantially no gap between the leg members.

4,449,531

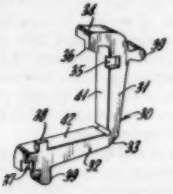
NON-METALLIC, BIO-COMPATIBLE HEMOSTATIC CLIPS WITH INTERLOCKING LATCH MEANS

Robert J. Cerwin, Pittstown, N.J.; Madhusudan Joshi, E. Aurora, N.Y.; John R. Menges, Woodbridge, N.J.; Robert W. Mericle, Lebanon, N.J., and William J. Zwaskis, Carteret, N.J., assignors to Ethicon, Inc., Somerville, N.J.

Filed Aug. 27, 1981, Ser. No. 296,672

Int. Cl.³ A61B *17/12, 17/00*

U.S. Cl. 128—325 **5 Claims**



1. A sterile hemostatic clip for application to a blood vessel and the like by utilizing a clip applying instrument, said clip comprising first and second leg members, each member having first and second sides joined by an outer surface and an elongated vessel clamping inner face in opposition to a vessel clamping inner face of the other leg member, said leg members being connected at their proximal ends by a resilient hinge means, said first leg member terminating at its distal end in a return bend hook portion, said second leg member terminating at its distal end in a complementary latch means for engagement by said hook portion of said first leg member, the hook portion of the distal end of said first leg member including a protrusion which is engagable in a recess in the distal end of said second leg member when said clip is in a closed position and said second leg member including a protrusion adjacent the distal end thereof which is engagable in a recess adjacent the distal end of said first leg member; said clip having each of said protrusions in each of said recesses contiguous with the same side of said first and second sides so that when said clip is in the closed position, with engagement between respective protrusions and recesses, lateral movement between said vessel clamping inner face is prevented.

4,449,532

DILATOR TO FACILITATE ENDOSCOPE INSERTION INTO THE BODY

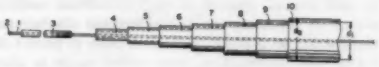
Karl Storz, Auf dem Schildrain 39, 7200 Tuttlingen, Fed. Rep. of Germany

Filed Jun. 30, 1981, Ser. No. 280,057

Claims priority, application Fed. Rep. of Germany, Jul. 8, 1980, 3025785

Int. Cl.³ A61M *29/00*

U.S. Cl. 128—341 **8 Claims**



1. A dilator for opening a path in the human body for the subsequent introduction of an endoscope shaft, said dilator having a distal end to enter the body, and a proximal end, comprising: a probe comprising a stiff rod and a ball on the end of said rod; and a plurality of expansion tubes adapted sequentially to enlarge a path formed by the introduction of the probe, ball first, into the body, each said tube having an inside and an outside diameter, the outside diameter of one tube being substantially equal to the inside diameter of the next larger tube, whereby to permit a close sliding axial telescopic fit, said rod being within and extending beyond said expansion tubes whereby the path opened by the ball can be incrementally opened by pressing next sequential tubes toward said ball.

4,449,533

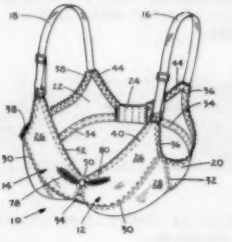
BRASSIERE

Flavia DiTullio, New York, N.Y., assignor to Consolidated Foods Corporation, Winston-Salem, N.C.

Filed Jul. 12, 1982, Ser. No. 397,365

Int. Cl.³ A41C *3/00*

U.S. Cl. 128—494 **7 Claims**

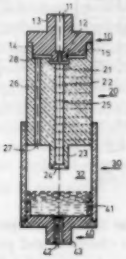


1. A brassiere comprising a pair of breast cups, a pair of back bands connected respectively to the outer edges of the breast cups, means for releasably connecting the free ends of said back bands, shoulder strap means attached to said breast cups and to said back bands for positioning over the shoulders of a wearer, each cup including upper and lower panels of selected configurations joined together to impart a desired shape to the cups, a member secured to the upper panels of said pair of breast cups, and ring-like means intermediate said pair of cups, and attached to said upper cup panels for coupling first inner peripheral edges of said upper panel of each of said pair of cups, said member and said ring-like means being in spaced relation.

4,449,534
LIQUID-FLOW MEASURING DEVICES, PARTICULARLY USEFUL FOR DRIP CHAMBERS

Leibinsohn Saul, 11 Oleh Hagardom St., Rishon Lezion, Israel

Filed Apr. 14, 1981, Ser. No. 253,801
Claims priority, application Israel, Apr. 16, 1980, 59850; Mar. 10, 1981, 62337
Int. Cl.³ A61M 5/16
U.S. Cl. 604—51 11 Claims

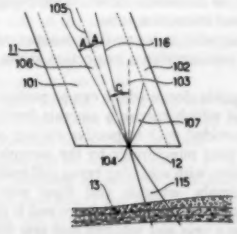


1. A liquid-flow measuring device particularly useful as a drip chamber for infusion administration sets and including a housing having an internal chamber for accumulating the liquid dripping thereinto by gravity introduced via an inlet port at one end, and for feeding the liquid therefrom via an outlet port at the opposite end; characterized in that said inlet port terminates in a first bore leading to a second bore at a juncture between the two bores, the housing further including an air passage leading to said juncture of the first and second bores, such that the liquid flowing through said first bore forms a liquid column in said second bore which liquid column grows downwardly by gravity and breaks away into said chamber before forming a drop at the bottom of said second bore, the length and/or rate said liquid columns grow before breaking away into the chamber thereby providing a measurement of the rate of flow of the liquid through said device.

4,449,535
APPARATUS FOR MEASURING IN SITU THE STATE OF OXIDATION-REDUCTION OF A LIVING ORGAN

Guy Renault, Paris, France, assignor to Compagnie Industrielle des Lasers Cilas Alcatel, Marcoussis, France

Filed Mar. 25, 1982, Ser. No. 362,012
Claims priority, application France, Mar. 25, 1981, 81 05948; Feb. 12, 1982, 82 02323
Int. Cl.³ A61B 5/00, 6/08
U.S. Cl. 128—634 13 Claims



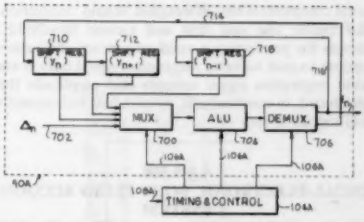
1. In an apparatus for measuring the oxidation-reduction state of a living organ in situ, said apparatus having:
- means for illuminating the organ with ultra-violet radiation and with radiation at another wavelength;
- a first photoelectric receiver means for detecting the intensity of fluorescence emitted by the organ in response to illumination by the ultra-violet radiation; and issuing an electric signal corresponding to the intensity of fluorescence and
- a second photoelectric receiver means for detecting the intensity of beam reflected by the organ in response to illumination by said radiation at another wavelength; and issuing an electric signal corresponding to the intensity of said reflected beam and

wherein the means for illuminating the organ include:
- a first laser generator adapted to limit pulses of ultra-violet radiation;
- a second laser generator adapted to emit pulses of radiation at said other wavelength;
- means for concentrating said pulses of both wavelengths onto a single point; and
- a single optical fibre having a core with a transmission axis, a cladding surrounding said core which has a lower refractive index than said core said fiber further having a first end adapted to be disposed in said organ and a second end disposed at said single point so as to:
- convey said pulses in one direction from the second end to the first end for illuminating said organ; and
- convey in the opposite direction firstly the fluorescence emitted by the organ in response to illumination by the ultra-violet pulses and secondly part of the other radiation reflected by the organ in response to illumination by the pulses at said other wavelength and processor means for calculating the oxygen-reduction state of the organ from the signals from said first and second photoelectric receivers, the improvement wherein;
- the first and second ends of the fibre have a first plane end surface and a second plane end surface respectively, said first plane surface having a normal forming an angle with the transmission axis that is greater than the limit angle of the fibre.

4,449,536
METHOD AND APPARATUS FOR DIGITAL DATA COMPRESSION

Charles S. Weaver, Palo Alto, Calif., assignor to SRI International, Menlo Park, Calif.

Filed Oct. 31, 1980, Ser. No. 202,457
Int. Cl.³ A61B 5/04
U.S. Cl. 128—696 26 Claims



1. In a system for processing a plurality of simultaneously occuring analog signals, which system includes,
- a plurality of analog to digital converter means responsive to individual analog signals for converting the same to fixed length digital sample signals,
- a plurality of digital compression filter means individually responsive to outputs from said analog to digital converter means for generating a plurality of difference signals related to the difference between the sample signal input thereto and an estimated value thereof,
- digital encoder means, and
- digital signal multiplexer means for sequentially connecting said difference signals from said digital compression filter means to said digital encoder means for sequentially en-

coding said difference signals and providing a serial stream of digital encoded difference signals.

4,449,537

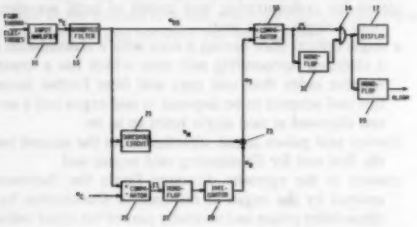
RESPIRATION MONITOR

Gerhard Pross, Weil im Schönbuch, and Frank Rochlitzer, Altdorf, both of Fed. Rep. of Germany, assignors to Hewlett-Packard GmbH, Boblingen, Fed. Rep. of Germany

Filed Mar. 8, 1982, Ser. No. 355,961

Int. Cl.³ A61B 5/05

U.S. Cl. 128—723 **9 Claims**



1. Apparatus for monitoring the respiration activity of a patient and for suppressing disturbing and spurious signals comprising:

respiration detector means connectable to a patient for providing a variable respiration signal corresponding to the patient's respiration activity;

first threshold circuit means coupled to said respiration detector means for producing an amplitude threshold decreasing at most to a given minimum value in response to a decreasing amplitude of said variable respiration signal;

first comparator means coupled to receive said variable respiration signal and a fixed amplitude threshold for suppressing said variable respiration signal below said fixed amplitude threshold;

second threshold circuit means receiving the output of said first comparator means and coupled to raise said amplitude threshold if the frequency of said variable respiration signal decreases below a predetermined frequency limit; and

second comparator means coupled to said respiration detector means and said first and second threshold circuit means for producing a valid respiration indication in response to said variable respiration signal only if said variable respiration signal exceeds said amplitude threshold produced, in combination, by said first and second threshold circuit means.

4,449,538

MEDICAL-ELECTRONIC BODY FLUID ACCOUNTING SYSTEM

John Corbitt, 1617 N. Fed. Hwy., Lake Worth, Fla. 33460, and Thomas J. Michel, 1011 NW. 198th St., Miami, Fla. 33169

Filed Jan. 25, 1982, Ser. No. 342,365

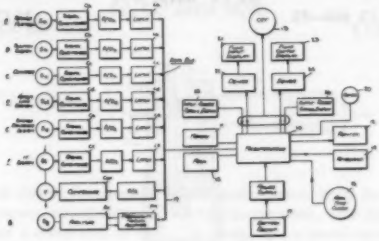
Int. Cl.³ A61M 1/00

U.S. Cl. 128—760 **16 Claims**

1. A body fluid medical-electronic accounting system for use in surgical procedures to afford a running account of fluid balance constituted by the ratio of the total fluid intake to a patient to the total fluid outtake therefrom, said system comprising:

A. a digital computer;

B. a plurality of data channels coupled to the computer related to the prevailing fluid input and output sources associated with the patient in the course of a given surgical procedure, each data channel including a sensor to sense a respective fluid to produce an analog signal as a function thereof, one of said output source channels having its sensor coupled to means for measuring the amount of blood and other fluids extracted from the patient by a sponge in the course of said surgical procedure, and means to convert the signal from each of the sensors in the system into a corresponding digital value to be entered into



the computer, the computer digesting the data acquired by the respective channels and performing computations to yield a fluid input total and a fluid output total; and

C. display means coupled to the computer to indicate said input and output totals to provide a reading of the fluid balance.

4,449,539

BLOOD EXTRACTION DEVICE

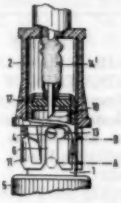
Walter Sarstedt, Nümbrecht, Fed. Rep. of Germany, assignor to Walter Sarstedt Kunstoff-Spritzgusswerk, Fed. Rep. of Germany

Filed Dec. 30, 1981, Ser. No. 335,902

Claims priority, application Fed. Rep. of Germany, Dec. 30, 1980, 3049503

Int. Cl.³ A61B 5/00

U.S. Cl. 128—764 **6 Claims**



1. In a blood extraction device comprising:

a cylindrical extraction tube;

a piston movable in an air-tight manner within said tube;

a closure cap carrying a projection at the front end of said tube;

a tubular guide sleeve which can be pushed over said projection and which carries a cannula having front and rear ends provided with respective cutting edges;

a closure plug puncturable by the cannula arranged in said projection, with said plug being self-sealing on removal of said cannula, wherein said front end of said cannula projects out of said guide sleeve and is provided for insertion into a vein and wherein said rear end of said cannula is sealingly covered by a thin hose having a closed rear end and projects sufficiently far into said guide sleeve that, on pushing said guide sleeve onto said projection, said rear end of said cannula first punctures said closed rear end of said hose and then punctures said closure plug; and

connecting means provided between said guide sleeve and said projection, said connecting means comprising a slot

provided on one of said guide sleeve and said projection and a cooperating lug engageable with said slot on the other one of said guide sleeve and said projection;

the improvement wherein:

said slot has (a) a first axially extending portion operative as the rear cutting edge of the cannula punctures said closed rear end of said hose and said closure plug to prevent relative rotation between said guide sleeve and said projection, and (b) a second peripherally extending portion permitting relative rotation between said guide sleeve and said projection to a locked position preventing relative axial movement therebetween, wherein the length of the axial slot and the arrangement of the retaining lug are so chosen that the retaining lug is guided in the axial slot up to a position at which the rear cutting edge of the cannula has already fully punctured the closure plug, and

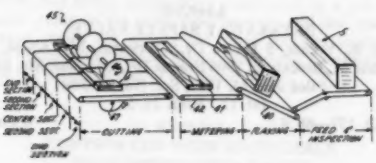
said thin hose is of resilient material and is adapted to generate an axially directed resilient force for retaining said guide sleeve in said locked position thereby preventing unintentional release of said guide sleeve from said projection.

4,449,540

SEPARATION OF LAMINA FROM STEMS IN BALED TOBACCO

Charles W. Marshall; William F. Lineberger, and Samuel A. Parker, Jr., all of Maysville, Ky., assignors to Parker Tobacco Company, Maysville, Ky.

Filed Feb. 17, 1982, Ser. No. 349,521
Int. Cl.³ A24B 5/00, 7/12
U.S. Cl. 131—290 **26 Claims**



1. A process for separating the lamina portions of baled tobacco leaves from stem portions thereof, comprising,

conveying baled tobacco in the form of either a whole bale or a layer of tobacco leaves separated from a bale, wherein the leaves are oriented with their stems at the ends of the baled tobacco and their tips are inward,

cutting said baled tobacco into at least three tranverse sections, including a center section and two second sections, one on each side of the center section, the center section comprising a portion which was at the longitudinal middle of the bale and having a substantially lower proportion of stem than the second sections,

directly after such cutting, conveying the second sections separately from the center section, thereby to separate the center section from the second sections,

coarsely threshing the second sections,

separating the threshed second sections into a first light fraction and a first heavy fraction,

finely threshing the first heavy fraction to dislodge additional lamina portions thereof,

separating the finely threshed material into a second light fraction and a second heavy fraction, the latter comprising principally stem portions, and

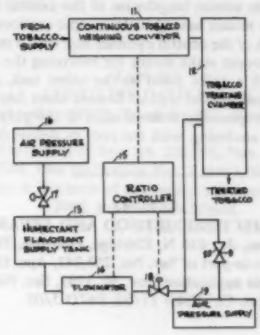
combining the center section with the first and second light fractions, thereby forming a fraction comprising principally lamina portions.

4,449,541

TOBACCO TREATMENT PROCESS

Charles D. Mays, Lewisville; Max A. Wagoner, and Daniel G. Williard, both of Winston-Salem, all of N.C., assignors to R. J. Reynolds Tobacco Company, Winston-Salem, N.C.

Filed Jun. 2, 1981, Ser. No. 269,086
Int. Cl.³ A24B 3/12
U.S. Cl. 131—302 **27 Claims**



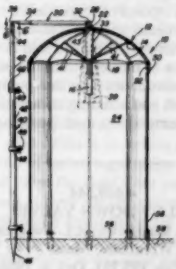
1. A continuous process for treating cut, shredded or otherwise comminuted tobacco which comprises subjecting a moving stream of cut, shredded or otherwise comminuted tobacco to a liquid spray comprising a volatile flavoring additive in a carrier medium containing a polyhydric alcohol as the principal component of said carrier medium, the quantity of said liquid spray being controlled with respect to the feed rate of said stream of tobacco by flow control means associated with a flow measuring device based on mass flow, regenerative sonics, magnetic flow or turbine flow principles which measures the flow rate of said carrier medium and the volatile flavoring additive contained therein.

4,449,542

PORTABLE HUNTING BLIND

Thad M. McSwain, 2103 Cherry, and Elbert A. McCracken, 509 S. Main, both of Stuttgart, Ark. 72160

Filed Dec. 23, 1981, Ser. No. 333,728
Int. Cl.³ A45B 11/00
U.S. Cl. 135—98 **9 Claims**



1. A portable hunting blind assembly comprising a collapsible umbrella roof means having a plurality of ribs extending from a central cylinder to the periphery of the roof means, the distal ends of the ribs defining points for sides of a polygon edge, the central cylinder extending from the roof means centrally within the roof means for a length proximate the free ends of the ribs, an inner sleeve member for sliding within the

length of the central cylinder from end-to-end thereof and having a projection extending from the sleeve member external of the central cylinder, a telescopic member connected by pivot means at one end to the projection and having an arm termination at the other end, an outer sleeve member for sliding on the exterior of the central cylinder, the outer sleeve member being provided with braces connected to the respective ribs, means connecting the inner and outer sleeve members for movement in unison lengthwise of the central cylinder, a telescopic stake means having its telescopic sections comparable to the length of the central cylinder and with a recess at one end of the telescopic stake means for receiving the arm termination and with a spike point at the other end, and means forming a circumferential wall of flexible sheet fabric depending from the peripherally defined sides of the polygon of the roof means for enclosing with the roof to define the portable hunting blind.

4,449,543

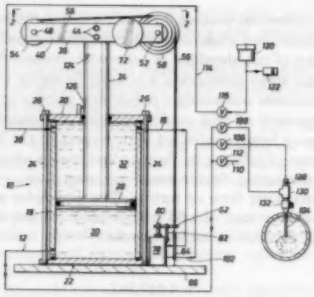
FLUID INJECTING METHOD AND APPARATUS

George J. Greene, Jr., 616 N. Eldridge, Houston, Tex. 77079

Continuation-in-part of Ser. No. 253,242, Apr. 13, 1981, abandoned. This application Nov. 30, 1982, Ser. No. 445,677

Int. Cl.³ F04B *13/00*; B67D *5/08*

U.S. Cl. 137—3 **12 Claims**



11. The method of injecting a fluid into a flowline including the steps of

delivering pressure fluid from the flowline to a pressure responsive positive displacement pumping means,

supplying fluid to be injected to said pumping means,

mechanically closing flow of fluid from said pumping means to said flowline responsive to excessive rate of movement of the pumping means and mechanically opening flow of fluid from said pumping means to said flowline responsive to insufficient rate of movement of the pumping means by mechanically interconnecting the pumping means, the controlling means and a timing means, and

delivering fluid pumped by said pumping means to said flowline.

4,449,544

BLOWDOWN VALVE

Roy E. Soderberg, N. Kingstown, R.I., assignor to Crosby Valve & Gage Company, Wrentham, Mass.

Continuation of Ser. No. 195,251, Oct. 8, 1980. This application Jun. 18, 1982, Ser. No. 389,853

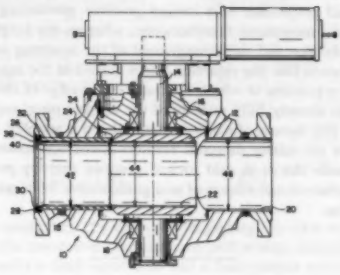
Int. Cl.³ F16K *5/20*

U.S. Cl. 137—15 **24 Claims**

1. A method of purging a pipeline of unwanted materials therein, comprising the steps of:

providing a valve within said pipeline, said valve including a valve body having inlet and outlet passageways, a valve ball having a bore therethrough and being journalled in said body to rotate said bore into and out of alignment with said passageways, and a gap defined between said valve body and ball establishing permanent fluid communication between said inlet and outlet passageways, said gap being relatively small in comparison to said bore and capable of passing only a relatively small amount of fluid therethrough;

positioning said valve ball in a closed position wherein fluid communication is established between said inlet and outlet passageways only by said gap;



admitting pressurized steam into said valve, said steam passing through said gap until the temperature within the portion of said pipeline downstream from said valve normalizes; and

quickly opening said valve such that said bore is aligned with said passageways, thereby creating a sudden pressure drop within said pipeline whereupon unwanted materials are expelled therefrom.

4,449,545

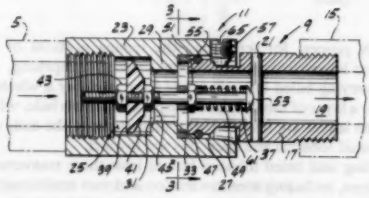
BREAKAWAY SAFETY VALVE

Oliver W. Vernor, 5 Prince Dr., Florissant, Mo. 63034, and Arthur M. Brockman, 1906 Brassie Dr., Overland, Mo. 63114

Filed Jan. 13, 1982, Ser. No. 339,094

Int. Cl.³ F16K *13/04*

U.S. Cl. 137—68 R **6 Claims**



1. A breakaway safety valve comprising interengageable plug and socket components, the socket component having a fluid flow passage therethrough with inlet and outlet ends, the outlet end forming a chamber for receiving said plug component therein, a valve seat in the passage, a valve member in the passage engageable with the valve seat, the valve member being movable in the passage between a closed position in which it is in sealing engagement with the valve seat to block flow therepast, and an open position in which it is spaced away from the valve seat to permit flow through the passage, spring means biasing the valve member toward its closed position, said plug component being engageable with the valve member for holding it open against the bias of said spring means to permit flow through the passage past the valve seat, and breakaway means holding the plug and socket components in assembly with the plug component received in said chamber and engaging the valve member to hold it open, said breakaway

means being adapted to break when the valve is subjected to a force of predetermined magnitude tending to pull the plug and socket components apart thereby to permit separation of the components without damage thereto, said valve member, at the time of said separation, being adapted to move in the passage under the bias of said spring means into sealing engagement with the valve seat to cut off flow therepast, said plug component having an outside diameter substantially smaller than the inside diameter of said socket chamber to provide a relatively large clearance therebetween, and the outlet end of said socket component being internally chamfered, said chamfer and clearance being sufficiently large relative to the distance which the plug component extends into the socket component to permit withdrawal of the plug component from the socket component without substantial damage to either component when an angular non-axial force is applied to the plug component, said plug component comprising a tubular plug body having inlet and outlet ends and an axial passage therethrough, said plug body having an external circular groove therein, said breakaway means comprising three shear pins threaded in radial bores spaced at intervals around the socket body, each pin projecting into said socket chamber and into said external circular groove in the tubular plug body to hold the latter in fixed position in said socket chamber, said valve member comprising valve stem means having upstream and downstream ends, and sealing means on the upstream end of the valve stem means engageable with said valve seat when the valve member is in its closed position, the downstream end of the valve stem means extending into said socket chamber and being engageable by said plug component, said socket component comprising a tubular body having an internal annular shoulder therein, said shoulder having a first face facing generally upstream and forming said valve seat, and a second face facing generally downstream, said valve stem means comprising a valve stem and abutment means on the downstream end of the valve stem, and a perforated disk around the valve stem seated against the downstream face of said internal annular shoulder, said spring means being constituted by a coil compression spring on the valve stem between said disk and said abutment means for biasing the valve member toward its closed position, said sealing means comprising a sealing member on the upstream end of the valve stem.

4,449,546

CONTROLLER WITH ADJUSTABLE PROPORTIONALITY RANGE

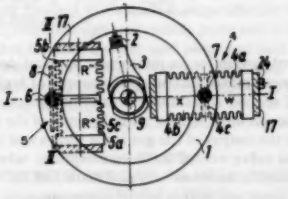
Horst Bader, Filderstadt, Fed. Rep. of Germany, assignor to Eckardt AG, Fed. Rep. of Germany

Filed Jun. 16, 1981, Ser. No. 274,501

Claims priority, application Fed. Rep. of Germany, Jun. 21, 1980, 3023316

Int. Cl.³ F01B *19/00*; F16J *3/04*; F15B *5/00*

U.S. Cl. 137—86 **28 Claims**



1. A controller arrangement with an adjustable proportionality range, the controller arrangement comprises at least first and second measuring units adapted to be acted upon by a pressure, a ring means adapted to be positioned in response to a pressure differential in the measuring units, and a pivotable nozzle means cooperable with the ring means,

the measuring units are coupled at the ring means in a diametrically opposite manner and the axis of effectiveness of one measuring unit extends radially and the axis of effectiveness of the other measuring unit extends in a direction which is one of tangentially and in parallel to the tangential direction but not through the axis of the ring means.

4,449,547

LONG LIFE GATE VALVE

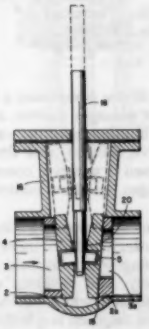
Rafael Krakovsky, 19581 Transhire Rd., Gaithersburg, Md. 20879

Continuation-in-part of Ser. No. 210,786, Nov. 26, 1980, Pat. No. 4,373,546. This application Feb. 1, 1983, Ser. No. 462,988

The portion of the term of this patent subsequent to Feb. 15, 2000, has been disclaimed.

Int. Cl.³ F16K *29/00*

U.S. Cl. 137—330 **3 Claims**



1. In a long life gate valve having a pair of rotatable closure discs mounted for longitudinally positioning into partial or full registration with mating valve seats to control fluid flow, the improvement for extending valve life by distributing wear about the periphery of the disc resulting from fluid flow thereacross substantially about the entire disc periphery for even wear thereabout, comprising in combination,

means presenting two spaced valve seats with flat surfaces surrounding flow apertures of different size that define a fluid flow path through the valve from a larger upstream aperture to a smaller downstream aperture,

a mating circular closure disc having a flat surface for mating with each said valve seat surface in a registration position for fully closing said fluid flow path,

movement means for longitudinally moving the center of both circular disc surfaces in unison along a straight line axis into and out of seated registration on said seat surfaces to restrict and close the fluid flow path,

means for holding at least the downstream closure disc in a freely rotatable mode about its center as it is moved along said axis into and out of seated registration so that it is rotatable by fluid flow in unseated transit positions,

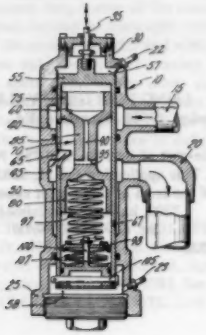
and aperture structure defined by said valve seats to present a fluid flow path asymmetrically disposed about the rotatable downstream disc whereby the fluid flow and pressure through the aperture structure and fluid flow path imparts a turning moment to the freely rotatable disc thereby to randomly present different portions of the disc edge to the fluid flow path through the valve seat in response to said turning moment when the discs are longitudinally moved in and out of registration

4,449,548

FLOW CONTROL DEVICE

Herbert W. Tutherly, Windsor, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Sep. 23, 1982, Ser. No. 421,758
Int. Cl.³ G05D *7/01*
U.S. Cl. 137—468 **8 Claims**



1. A flow control device comprising a housing having fluid inlet and fluid outlet passages therein, a first valve element disposed within said housing, a second valve element disposed within said first valve element, said first and second valve elements being disposed in selective communication with said inlet and outlet passages, said flow control device being characterized by:

said first valve element comprising a metering element having inlet and outlet windows therein corresponding to, and communicating with said fluid inlet and outlet passages, respectively, said metering valve element being selectively positionable within said housing such that one of said windows is disposed in selectively variable registry with the corresponding passage for adjusting the effective flow area therebetween;

said second valve element comprising a pressure regulating element having first and second ends thereof and including a first portion in variable registry with the other of said windows in said metering element for adjusting the flow therethrough;

means providing fluid communication between said corresponding passage and said second end of said pressure regulating element;

means providing fluid communication between said one window on a side thereof opposite said corresponding passage and said first end of said pressure regulating element; and

means for balancing said pressure regulating element against fluid pressure on said first and second ends thereof for establishing a registry between said other window and said first portion of said pressure regulating valve element necessary to maintain a relatively constant pressure drop across said one window.

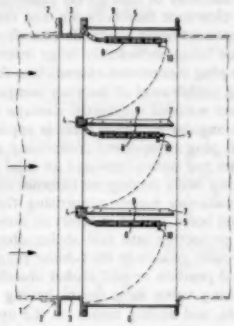
4,449,549

SHUTTER DEVICE FOR AIR CONDUIT OR THE LIKE

Franz Weck, Herzogenrath, Fed. Rep. of Germany, assignor to H. Krantz GmbH & Co., Herzogenrath, Fed. Rep. of Germany

Filed Feb. 7, 1983, Ser. No. 464,351
Claims priority, application Fed. Rep. of Germany, Mar. 19, 1982, 8207890[U]
Int. Cl.³ F16K *15/03, 15/16*
U.S. Cl. 137—512.1 **6 Claims**

1. A chatter resistant shutter device for an air conduit or the like comprising a rectangular attachment section adapted to be mounted to a conduit end, a rectangular frame section affixed to an end of said attachement section, said frame section including side wall portions and upper and lower wall portions, a plurality of mutually spaced apart parallel web members extending between said side wall portions adjacent the interface of said sections, said webs defining therebetween a series of generally rectangular openings, a plurality of generally rectangular elastomeric lamellae in number corresponding to



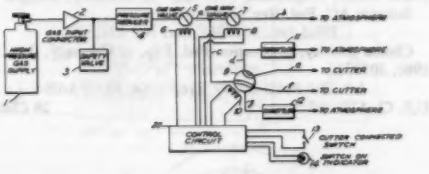
the number of said openings, each said lammelae having an upper edge portion affixed to a said web, said lamellae being shiftable within said frame section responsive to flow in said conduit between a closed position whereat said lamellae are normal to the longitudinal axis of said frame in mutually overlapping position and an open position generally parallel to said axis, and a guide plate member fixed to each said web and extending parallel to said axis.

4,449,550

CONTROL SYSTEM FOR INTRAOCULAR SURGICAL DEVICE

Domenico Ranalli, Rome, Italy, assignor to Optikon Oftalmologia, S.p.A., Rome, Italy, 5n 20 Paul Fields McAulay, Fields, Fisher et al. 405 Lexington Ave. New York, NY 10174 S

Filed Nov. 2, 1981, Ser. No. 317,115
Int. Cl.³ F15B *21/08;* **A61F** *9/00*
U.S. Cl. 137—624.13 **7 Claims**



1. A control system for an intraocular surgical device comprising: gas input means receptive of a supply of high pressure gas; first and second actuatable one-way valves connected in series with the gas input means, with the input of the first valve connected to the output of the gas input means and the output of the second valve vented to the atmosphere, wherein each valve is actuatable between a closed state and an open state wherein the input and output are in communication; five-way actuatable valve means having an input connected to the series connection between the first and second valves, two outputs vented to the atmosphere and two outputs connectable to a surgical device, wherein the valve means is actuatable between a first state wherein the input is in communication with one device output and the other device output is in communication with one venting output and a second state wherein the input is in communication with the other device output and the one device output is in communication with the other venting

output; and control means for maintaining the first and second valves in the closed and open states respectively and responsive to the connection of a device to said control system for thereafter reversing said states and for selectively actuating the five-way valve means between the first and second states only when the first valve is open and the second valve is closed.

4,449,551

MIXING VALVE

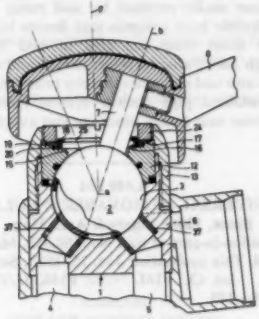
Werner Lorch, Schramberg, Fed. Rep. of Germany, assignor to Hans Grohe GmbH & Co., Fed. Rep. of Germany

Filed Jun. 17, 1981, Ser. No. 274,672

Claims priority, application Fed. Rep. of Germany, Jun. 28, 1980, 3024518

Int. Cl.³ F16K *11/087*

U.S. Cl. 137—625.41 **39 Claims**



1. In a mixing valve for liquids, having: a ball-like valve plug with liquid inlet and liquid outlet ports therein, said ports being joined together within said plug; a valve housing having a valve seat face of the same form as the plug with said plug resting thereon, said plug and said housing having a common middle point about which said plug is rotatable relative to said housing, said housing having inlet ducts for the liquids to be mixed and an outlet duct for the mixed liquids, said ducts having ports in said face; and, a driving part fixed to said plug, rockable in a plane of rocking therewith about a rocking axis perpendicular to the rocking plane, for changing the outlet flow rate of liquid from the valve and rotatable therewith for changing the mixing ratio of the two liquids, said driving part having a lengthwise axis, the invention comprising: a guide plate for said driving part, said plate having a slot in and along which said driving part is movable, but keyed against rotation relative to said slot, said guide plate being turnable in a plane parallel to said rocking axis, said plug being rotatable only about a plug rotation axis which is perpendicular to said guide plate plane, runs through said middle point and is fixed relative to said valve housing but not said plug, and said driving part being rockable only about said rocking axis, which runs through said middle point and is fixed relative to said plug but not said valve housing.

4,449,552

PRESTRESSED ASSEMBLED OLEO-PNEUMATIC ACCUMULATORS

Louis C. Porel, Rambervillers, France, assignor to Hydro Rene Leduc, Baccarat, France

Filed Feb. 11, 1982, Ser. No. 457,702

Claims priority, application France, Feb. 27, 1981, 81 03926; May 8, 1981, 81 09206

Int. Cl.³ F16L *55/04*

U.S. Cl. 138—30 **15 Claims**

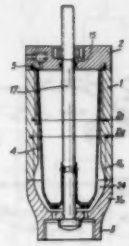
1. An oleopneumatic accumulator having a first chamber adapted to receive a pressurized gas, and a second chamber adapted to receive pressurized hydraulic fluid and a flexible membrane therebetween, comprising:

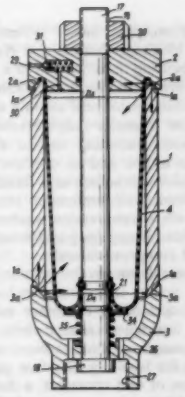
a cylindrical shell having first and second open ends the inner boring of said shell having a larger section at its second end then its first end;

a first plug disposed in said cylindrical shell first open end, a peripheral edge of said membrane being disposed therebetween;

a second plug disposed in said cylindrical shell second open end; and

at least one pretensioned tierod having a tension corresponding to a predetermined hydraulic fluid pressure and having first and second ends, one of said ends being coupled to one of said plugs and the other of said ends being threaded to receive a nut for couplig to said remaining plug, whereby said cylindrical shell will separate from said second plug when said predetermined pressure is





exceeded bringing about a decrease in hydraulic pressure and returning said pressure to a value less then said predetermined pressure.

6. An oleopneumatic accumulator having a first chamber adapted to receive pressurized gas, and a second chamber adapted to receive a pressurized hydraulic fluid and a flexible membrane disposed between said first and second chambers, said accumulator comprising:

a cylindrical shell having first and second open ends, the inner boring of said shell having a larger section of its second end than its first end;

a first plug disposed in said cylindrical shell first open end, a peripheral edge of said membrane being disposed between said first plug and said first open end;

a second plug disposed in said cylindrical shell second open end; and

at least one elastic tierod having first and second ends, one of said ends being coupled to one of said plugs and the other

of said ends being threaded to receive a nut for coupling to said remaining plug, said tierod being set under a tension prior to coupling to said plugs, said tension corresponding to a predetermined hydraulic fluid pressure;

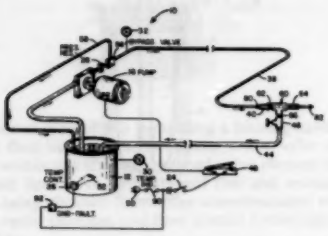
whereby said cylindrical shell will separate from said second plug when said predetermined pressure is exceeded, bringing about a decrease in hydraulic pressure and returning said pressue to a value less than said predetermined pressure.

4,449,553

ELECTRICALLY HEATED PIPE THAWING APPARATUS

Edward F. Sullivan, 18450 Thorpe Rd., Wayzata, Minn. 55391; Patrick Sullivan, 18645 Rutledge Rd., Wayzata, Minn. 55391, and Walter C. Schultz, 4390 Coolidge Ave., Edina, Minn. 55424

Filed Nov. 24, 1980, Ser. No. 209,976
Int. Cl.³ E03B 7/14; F24H 1/20
U.S. Cl. 138—35 **1 Claim**



1. In combination, pipe thawer system for thawing a pipe having a frozen blockage therein, said system comprising:

a. means for securing onto one end of a pipe having a frozen blockage therein, said securing means including a means forming a compression seal about a small diameter, quarter-inch outer diameter polyurethane flexible hose, said securing means including conical shaped pipe reducer including an inflow and an outflow end, a hole in said inflow end through which said flexible hose slidably extends, a threaded circumference about said inflow end, and a nut with a compression washer threaded over said circumference for engaging and securing about said hose to form said compression seal;

b. wheeled portable means for containing a predetermined quantity of water, said means including a substantially rectangular upstanding container means for supporting said system, four wheels spaced about an underside of said container means for rolling motion, and including a separating plate for isolating fifty-five gallons of liquid in a lower portion of said container, a discharge outlet in the bottom of said container means and a liquid-fill vent valve on one side of said container means slightly below said separating plate;

c. said flexible hose piping water from said container means and through said inflow end of said securing means towards said frozen blockage, said flexible hose supported on a substantially circular reel means on one side of said container means;

d. means for pumping water from said container to said flexible hose, said pumping means supported in a top portion of said container means and including a foot pedal connected to said pump means for actuating said pump means and a pressure regulator means in line with said flexible hose and a bypass line hose means connected between said pressure regulator means and said container means;

e. variable temperature control means including electric heater means immersed in said container means for heating said water to a predetermined temperature of 100°–150° F.;

f. electrical circuit means supported in said container means powering said pump means and said variable temperature control means, said electrical circuit means including circuit breaker means and ground fault indicating means connected between said pump means and said variable temperature control means and a source of power, and said electrical circuit means and pump means supported above said separating plate and isolated from liquid in a lower portion of said container means; and,

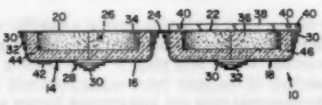
g. return hose means for piping return water from a T-shaped return means to said container means, said T-shaped return means connected between said outflow end of said pipe reducer and said pipe with said frozen blockage, a leg of said T-shaped return means connected to said return hose means, said return hose means supported on a substantially circular reel means on an other side of said container means whereby said water is piped from said container under pressure by said pump means through said flexible hose towards said frozen blockage, forcing return water from the area of said frozen blockage through said T-shaped return means and said return hose means into said container thereby providing a closed-loop, self-contained pipe thawer system including feedback fluid from said frozen blockage and avoiding liquid spillage.

4,449,554

UNIVERSAL REMOVABLE INSULATION

Richard O. Busse, 12863 Ingersoll Ave., Hugo, Minn. 55038

Continuation-in-part of Ser. No. 360,355, Mar. 22, 1982, abandoned. This application Jan. 25, 1983, Ser. No. 460,906
Int. Cl.³ F16L 59/02; F16K 51/00
U.S. Cl. 138—149 **17 Claims**



1. A removable, reusable insulation for insulating various hot and cold fluid conduit fittings, comprising a shell bifurcated along a plane to define a pair of engagable edges and having a plurality of defined cut-outs formed therein with a portion of each of said cut-outs formed in each of said edges, said cut-outs being positioned relative to one another so that angularly spaced portions of a fitting can pass through different of said cut-outs.

4,449,555

DEVICE FOR TRANSFERRING ARTICLES

Jacobus H. Luyten, Va Steyl, Netherlands, assignor to Helmes Machinefabriek B.V., Netherlands

Filed Apr. 5, 1982, Ser. No. 365,479
Claims priority, application Netherlands, Apr. 6, 1981, 8101689
Int. Cl.³ B27F 1/00
U.S. Cl. 144—198 R **10 Claims**

10. A tenoning machine for an article, the tenoning machine having a tending side and being operated from the tending side, the tenoning machine comprising:

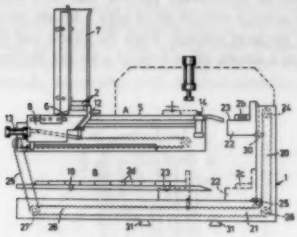
a working path having a first end at the tending side and a second end opposite the tending side;

conveying means for displacing the article from the first end to the second end of the working path;

a discharge path lower than the feed path, the discharge path comprising a support rail below the working path, the article moving on the support rail toward the tending side;

a guide track comprising a vertical component situated at the second end of the working path for changing the direction of movement of the article when the article leaves the second end of the working path, the guide track

further comprising a horizontal component below the level of the support rail for bringing the article to the discharge path in a pre-oriented position;



a movable carrier mounted on the guide track for carrying the article along the vertical and horizontal components after tenoning;

driving means connected to the conveying means for driving the carrier.

4,449,556

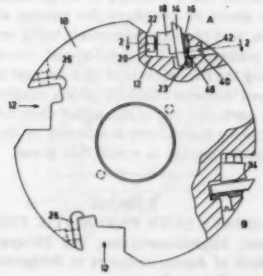
ROTARY CUTTER HEADS

Peter M. Colton, Leicester, England, assignor to Wadkin plc, Leicester, England

Continuation-in-part of Ser. No. 409,994, Aug. 20, 1982, abandoned. This application Sep. 28, 1982, Ser. No. 425,504

Int. Cl.³ B27G *13/04*

U.S. Cl. 144—230 **26 Claims**



1. A rotary cutter head for woodworking machinery comprising:

a cylindrical cutterblock body;

a plurality of inwardly divergent recesses formed in said cutterblock body;

a cutter blade positioned in each of said recesses;

clamp means in each of said recesses, said clamp means each comprising a wedge and screw means associated with the wedge, the screw means being tightenable against a face of a recess to urge the wedge into direct contact with an associated cutter blade positioned in the said recess to clamp the blade in the recess; and

resilient means in each recess, each resilient means acting on an associated clamp means to lightly hold the cutter blade in position on slackening of the associated screw means.

4,449,557

METHOD AND APPARATUS FOR SAWING A PIECE OF TIMBER

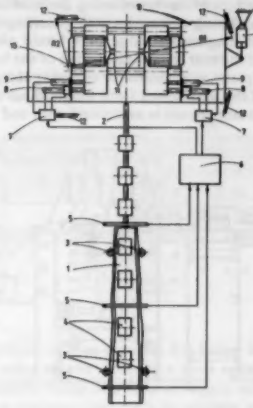
Olavi Mäkelä, Karhula; Ossi Suntio, Neuvoton, and Jorma Tuomaala, Karhula, all of Finland, assignors to A. Ahlstrom Osakeyhtio, Noormarkku, Finland

Filed Jun. 1, 1982, Ser. No. 383,572

Claims priority, application Finland, Jun. 12, 1981, 811830

Int. Cl.³ B27B *1/00*

U.S. Cl. 144—357 **4 Claims**



1. An apparatus for sawing and edging a board which has two unfinished sides which comprises means for centering the board symmetrically in relation to a feed line, means for measuring the optimum sawing direction and width of the board, a sawing machine for edging the sides of the board and for sawing the board, the sawing machine comprising blades, a cylinder connected to said sawing machine, the sawing machine being pivotally mounted upon said cylinder, said cylinder carrying out a pivotal movement around a pivot axis which is in a line transverse to the feed line passing through the sawing points.

4. The method of sawing and edging a board which has two unfinished sides which consists of:

(1) centering the board symmetrically in relation to the feed line;

(2) determining the optimum width and direction of the board by means of a plurality of gates;

(3) transferring the board though an edger comprising sawing blades which move laterally in relation to the feed direction;

(4) pivoting the edger around a vertical pivot axis which is transverse to the feed line and passes through the sawing points;

(5) turning the blades in relation to the feed direction so as to set them in the sawing direction.

4,449,558

METHOD AND APPARATUS FOR TRIMMING WOODEN BOARDS

Karl-Wolfram Wiegand, Bochum, Fed. Rep. of Germany, assignor to Dimter GmbH Maschinenfabrik, Illertissen, Fed. Rep. of Germany

Filed Aug. 26, 1981, Ser. No. 296,313

Claims priority, application Fed. Rep. of Germany, Dec. 27, 1980, 3049258

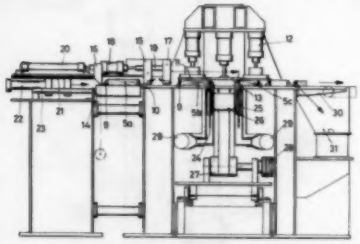
Int. Cl.³ B27M *1/08*; B27B *1/00*

U.S. Cl. 144—367 **13 Claims**

1. A method for trimming wooden boards comprising the steps of: fixing and cutting two positioning short cuts at the

ends of each longitudinal edge of the boards to be cut and trimming the boards wherein the positioning short end cuts of one longitudinal edge of the board are used to move that longitudinal board edge into a first cutting plane of a cutting device and the positioning short end cuts of the other longitudinal edge of the board are used to move that longitudinal board edge into a second cutting plane of the cutting device.

2. An apparatus for trimming wooden boards comprising: means for fixing and cutting two positioning short cuts at the ends of each longitudinal edge of the board for defining a proposed trimming line therebetween and means for trimming the longitudinal edges of the board using the positioning short end cuts, said trimming means including cutting means for cutting the front longitudinal edge of a board along a first cutting plane and the rear longitudinal edge of the board along a second cutting plane, stop means for engaging the positioning short end cuts of the untrimmed front longitudinal edge of the board and which stop means is associated with and parallel to



the first cutting plane of the cutting means for cutting the front longitudinal edge of the board, slide means for advancing the board and moving the positioning short end cuts of the front longitudinal edge of the board against the stop means, ejector means for engaging the positioning short end cuts of the untrimmed rear longitudinal edge of the board, and which ejector means is associated with and parallel to the second cutting plane of the cutting means for cutting the rear longitudinal edge of the board, wherein the slide means, stop means and ejector means are jointly displaceable and move the rear longitudinal edge of a first board into the second cutting plane of the cutting means and move the front longitudinal edge of a second board into the first cutting plane of the cutting means and wherein the cutting means cuts the rear and front longitudinal edges of the two respective boards along the proposed trimming lines defined between the positioning short cuts at the ends of the rear and front longitudinal edges of the two respective boards.

4,449,559

HAND TOOL WITH HANDLE STORAGE OF INTERCHANGEABLE ELEMENTS

Werner W. Martinmaas, 3461 Cashill Blvd., Reno, Nev. 89509

Continuation-in-part of Ser. No. 218,435, Dec. 19, 1980, abandoned, which is a continuation of Ser. No. 37,908, May 10, 1979, abandoned. This application Sep. 10, 1981, Ser. No. 300,819

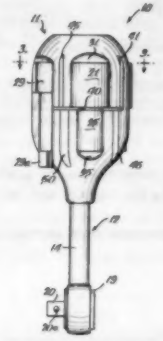
Int. Cl.³ B25G *1/08*

U.S. Cl. 145—62 **5 Claims**

1. In a hand tool which has a generally cylindrical handle provided with a bore, and mounting means to selectively mount any of a plurality of interchangeable tool elements, said mounting means including a shank non-rotatably mounted in said bore in the handle, and means at the end of the shank remote from the handle to operatively receive one of said tool elements at a time, the improvement comprising:

the interchangeable tool elements are socket wrench socket elements each of which is cylindrical with a first end portion having an axially extending square drive hole and a second end portion having an axially extending hexagonal socket, said socket elements being of various diameters, all of said drive holes being identical with one another, and all of said hexagonal sockets being of different sizes each of which is adapted to slidably and non-rotatably engage a hexagonal fastener of a predetermined size;

the means to operatively receive said tool elements is a socket wrench ratchet drive with a square mounting stub which projects laterally from the shank and slidably engages in a square drive hole of a socket element;



and the handle has a plurality of longitudinally extending pockets about its periphery for storing all said socket elements, said plurality of pockets being arranged in sets of two pockets which are end-to-end, there is a partition separating the two pockets of each set, and the pockets are of various diameters each of which snugly receives and stores a particular one of the socket elements, each socket element being individually removable by digital manipulation from the pocket in which it is stored.

4,449,560

HEAVY DUTY PNEUMATIC TIRE

Hikaru Tansei, Higashimurayama, and Hiroyoshi Takigawa, Kodaira, both of Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

Filed May 4, 1982, Ser. No. 374,824

Claims priority, application Japan, May 13, 1981, 56-68774[U]; May 13, 1981, 56-68775[U]; May 13, 1981, 56-68776[U]

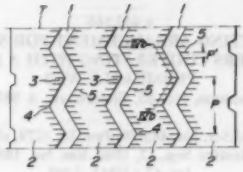
Int. Cl.³ B60C *11/12*

U.S. Cl. 152—209 R **8 Claims**

1. A heavy duty pneumatic tire comprising; a tread surface divided along circumferential directions by at least two zigzag tread grooves having sides extending into said tread surface to form a plurality of circumferential zigzag ribs whose at least one side edge adjacent to said zigzag tread groove is formed with a plurality of narrow cuts opening into said tread grooves and substantially in parallel with an axial direction of the tire, said narrow cuts being formed so as to substantially continuously increase a rigidity of said rib from extending corners to retracting corners of said rib without any abrupt rigidity differ-

ence, and the depths of said narrow cuts are gradually reduced from those in said extending corners to those in said retracting corners.

4. A heavy duty pneumatic tire comprising a tread surface divided along circumferential directions by at least two zigzag tread grooves having sides extending into said tread surface to form a plurality of circumferential zigzag ribs whose at least one side edge adjacent to said zigzag tread groove is formed with a plurality of narrow cuts opening into said tread grooves and substantially in parallel with an axial direction of the tire,



the improvement comprising said narrow cuts being formed so as to substantially continuously increase a rigidity of said rib from extending corners to retracting corners of said rib without any abrupt rigidity difference; said cuts between said extending and retracting corners are inclined relative to radial surfaces of the tire passing through openings of said cuts at said tread surface such that bottoms of the cuts are shifted away from said radial surfaces towards radial surfaces passing through the extending corners to form angles with their radial surfaces, said angles being progressively larger as said cuts are nearer said extending corners.

4,449,561

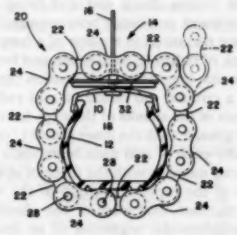
NON-SKID DEVICE FOR WHEELCHAIRS AND THE LIKE

Randall T. Head, 2937 Butte Ave., Santa Clara, Calif. 95051

Filed Mar. 21, 1983, Ser. No. 477,508

Int. Cl.³ B60C *27/00*

U.S. Cl. 152—213 R **15 Claims**



1. A non-skid chain device for the spoked wheels of wheelchairs, bicycles and the like having a felly and tire of given cross-sectional circumference, said device comprising a length of side link, sleeve and pin-type chain sufficient to surround said given cross-sectional circumference of said felly and tire, with one end of said length of chain terminating in the free ends of a pair of spaced side links and the other end of said length of chain terminating in a pair of side links interconnected by a sleeve adapted to be received between said free ends of said spaced side links of said one end of said length of chain; a slotted plate member having transverse dimensions greater than the transverse dimensions of said length of chain rigidly fixed to said one end of said length of chain with the slot of said slotted plate member dimensioned to receive a spoke of said spoked wheels centrally disposed and aligned between said spaced side links of said one end of said length of chain, said slot terminating between said spaced side links centrally thereof and opening at said free ends of said spaced side links; and a removable pin for selectively interconnecting the ends of said length of chain.

4,449,562

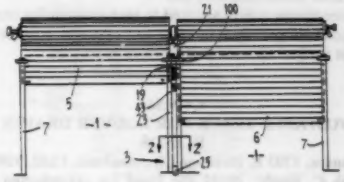
MULLION SECTION MEMBER

Simon Leivenzon, and Steven Leivenzon, both of Caulfield, Australia, assignors to Firmagroup Australia Pty. Ltd., Cheltenham, Australia

Continuation-in-part of Ser. No. 250,253, Apr. 2, 1981, abandoned, which is a continuation of Ser. No. 83,650, Oct. 11, 1979, abandoned. This application Jun. 26, 1981, Ser. No. 278,219

Int. Cl.³ E06B *3/48*

U.S. Cl. 160—113 **7 Claims**



1. A mullion section member for fitting between a pair of adjacent roller shutter doors in a door opening, said mullion section member being of a suitable length and having opposed channels at opposite sides each for slidably receiving the edge of the curtain of a respective roller shutter door, a portion bridging the two channels, and behind said portion on the inside face of the mullion section member, flange means which extend the length of the mullion section and define a recess behind said portion in which a plate-like tongue member is slidably received to slide longitudinally of the length of the mullion section member, means fastened to said flange means slidably securing said tongue in said recess at one end of the mullion section member whereby the mullion section can be cut to the required length and said plate-like tongue member located in the correct operative position by said securing means then being secured at the required position on said flange means.

4,449,563

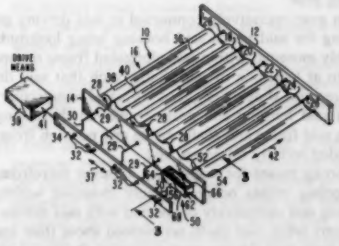
COUNTERBALANCE SYSTEM FOR SAGGING ROTATING ELEMENT

Minoru Toda, and Susumu Osaka, both of Tokyo, Japan, assignors to RCA Corporation, New York, N.Y.

Filed May 26, 1982, Ser. No. 382,200

Int. Cl.³ E05D *15/18*

U.S. Cl. 160—184 **10 Claims**



6. In combination:
an element of a thickness and material which tends to bend

a first value in a given direction in response to the force of gravity on the mass center of said element when said element is in one angular orientation and a second different value when in a second different angular orientation;

means for rotatably supporting the element between two spaced points for rotation about an axis from one to the other of said angular orientations, said axis passing through the mass center of said element in the unbent state, said bent element mass center being offset from said axis in a first range of values, each value in said range corresponding to a different angular orientation of said element about said axis, said offset mass center due to bending of the element creating in response to the force of gravity a first torque about said axis having a value in a second range of values corresponding to each said offset values in said first range of values when the element is rotated about said axis; and

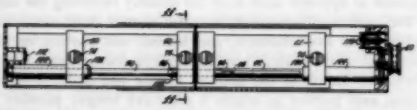
counter-torque means secured to said element for creating a second torque equal in value and opposite in sense to said first torque value as said element is rotated.

4,449,564

ADJUSTABLE TRACK FOR LOUVER DRAPES OR BLINDS

Don Hansen, 1703 E. Heritage Cir., Anaheim, Calif. 92804, and Joseph C. Ranftl, 20192 Big Bend La., Huntington Beach, Calif. 92646

Filed Aug. 27, 1981, Ser. No. 297,048
Int. Cl.³ E06B 9/26
U.S. Cl. 160—166 A **1 Claim**



1. Adjustable support and positioning means for vertical louver drapes of the type in which louvers are suspended from multiple trucks, comprising:

multiple trucks for suspending said louvers,

a pair of axially aligned elongated frame means adapted for nesting one within the other and telescoping between an extended position and a retracted position, and

a pair of elongated shafts each having substantially uniform noncircular cross sections and being mounted within said frame means and adapted to support and permit sliding movement of said trucks along said shafts,

said shafts being capable of sliding in relation to each other between extended and retracted positions corresponding to the extended and retracted position of said frame means,

each of said multiple trucks having

a driving gear,

a driven gear operatively connected to said driving gear,

a housing for said gears, said housing being longitudinally slidably mounted within said elongated frame means relative to at least one of said shafts, such that said driving gear remains slidably engaged with said noncircular shaft when said housing and gear are moved therealong and when said frame and shafts are in any position from fully extended to fully retracted, and

a supporting means for suspending a louver therefrom, said supporting means being rotatably mounted within said housing and operatively connected with said driven gear, whereby when said shafts are rotated about their longitudinal axes, said driving gear is rotated therewith and rotates said driven gear and said supporting means,

said shafts being axially aligned and one of said pair of shafts being tubular and having an inside diameter sufficient to permit the other of said pair to telescope therein between said extended and retracted positions,

the outer shaft of said pair of shafts including engaging means affixed along its outer surface for slidably engaging said driving gears of said trucks and having a slot through the wall of said outer shaft parallel to the axis thereof,

the inner shaft of said pair of shafts including engaging means affixed along its outer surface and sized to extend outwardly through said slot through the wall of said outer shaft for slidably engaging said driving gears.

4,449,565

CONNECTING ARRANGEMENT FOR SUPPORT MEMBERS COOPERATING WITH A LIQUID PERMEABLE WEB

Heinrich Bartelmuss, No. 63, Steiermark, A 8833 Teufenbach, Austria

Continuation of Ser. No. 48,078, Jun. 13, 1979, abandoned. This application Sep. 17, 1980, Ser. No. 188,033
Int. Cl.³ D21F 7/00
U.S. Cl. 162—352 **7 Claims**

1. A connecting assembly for a hard-material member and a rigid support member in flat contact with one another along planar juxtaposed surfaces whereby the hard-material member of an oxide ceramic forms a support for a water-permeable layer for the dewatering of a pulpy mass, said assembly comprising in combination with said members, a plurality of U-shaped spring clips interconnecting same and bridging said surfaces, the bights of said clips being received in said rigid support member, the hard-material member being formed with circular-arc grooves opening inwardly from the respective one of said surfaces and formed in pairs, each of said clips having a pair of shank ends received in a respective pair of grooves each individual to one shank end and being of circular-arc curvature, each shank end being bent outwardly with a circular-arc curvature measured in a plane of a longitudinal dimension of the shank of radius R, each shank end further being bent transversely to its longitudinal dimension to be outwardly concave with a circular curvature of said radius R, the free edges of the ends of the shanks of the clips having radius r that is at least 0.5% greater than the inner radius r′ of the respective grooves whereby each of said ends bears upon the material of said hard-material member with the force of at least 1 g but not more than 5% of the rupture strength of the material of said hard-material member, said ends of the shanks of said clips conforming to spheroidal segments of an imaginary sphere having said radius R of at least 3 mm and up to a maximum of 500 mm, the free edges of said shanks lying along a cutting circle whose radius r is at least 1 mm and up to 90% of the radius R of the imaginary sphere.

7. A paper-making machine having a liquid-permeable layer for the dewatering of a pulpy mass and a drainage region across which said layer is displaced and formed with at least one assembly as defined in claim 1.

4,449,566

FOUNDRY SAND RECLAMATION

Anthony J. Filipovitch, Dearborn, and Julius M. Bleuenstein, Rockwood, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

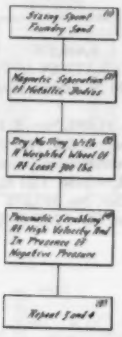
Filed Apr. 9, 1979, Ser. No. 28,134
Int. Cl.³ B22C 5/00
U.S. Cl. 164—5 **8 Claims**

1. A method of conditioning a spent foundry sand mixture,

said mixture containing 0.1–12% clay, said clay forming a shell on the grains of said mixture, the method comprising:

(a) while under ambient pressure and temperature conditions and without the addition of water, subjecting said mixture to a high-stress, low-kinetic energy squeezing action effective to slowly rub the mixture grains against each other and to fragment at least part of the shells on substantially each sand grain in said mixture,

(b) while in the presence of a negative pressure or suction,



propelling said squeezed mixture grains against a target and/or against each other in a high-kinetic energy stream, the sand mixture in said stream having flow rate of 1000–10,000 pounds per hour through a discharge opening having a diameter of 0.6–2 inches, whereby the remaining fragments of said shells on said mixture grains are dislodged and many particles finer than 200 mesh are separated by said suction, and

(c) subject said mixture of burst shells and sand grains to classification for separation.

4,449,567

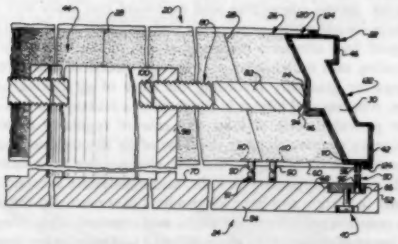
METHOD AND APPARATUS FOR USE IN CASTING AN ARTICLE

William S. Blazek, Valley City, and Thomas S. Piwonka, Solon, both of Ohio, assignors to TRW Inc., Cleveland, Ohio

Filed Aug. 6, 1979, Ser. No. 63,860

Int. Cl.³ B22D *33/04*

U.S. Cl. 164—137 **25 Claims**



1. A method of assembling a mold which is utilized to cast an article, said method comprising the steps of positioning a plurality of mold wall segments in an array having circular upper and lower end portions, changing the diameter of the lower end portion of the array of mold wall segments relative to the diameter of the upper end portion of the array of mold wall segments by moving lower end portions of the mold wall segments relative to upper end portions of the mold wall segments, and changing the diameter of the upper end portion of the array of mold wall segments relative to the diameter of the lower end portion of the array of mold wall segments by moving the upper end portions of the mold wall segments relative to the lower end portions of the mold wall segments.

4,449,568

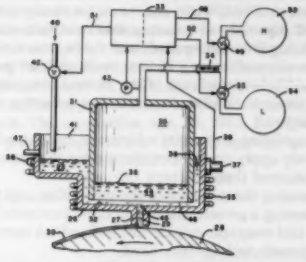
CONTINUOUS CASTING CONTROLLER

Mandayam C. Narasimham, Flanders, N.J., assignor to Allied Corporation, Morris Township, Morris County, N.J.

Continuation of Ser. No. 125,722, Feb. 28, 1980, abandoned, which is a continuation of Ser. No. 971,618, Dec. 20, 1978, abandoned. This application Oct. 19, 1981, Ser. No. 312,208

Int. Cl.³ B22D *11/06, 11/10, 11/16*

U.S. Cl. 164—453 **5 Claims**



1. Apparatus for the continuous casting of continuous filaments of glassy metal alloy comprising:

(a) a chill roll having cooling means for quenching a stream of molten metal at a quench rate sufficient for glass formation;

(b) a nozzle which has an orifice disposed so as to direct a stream of molten metal onto the chill surface of said chill roll; and

(c) extrusion means for continuously and indefinitely extruding molten metal through said nozzle at a substantially constant pressure from a non-pressurized reservoir containing molten metal and communicating with said nozzle, said reservoir having a pressure bell disposed internally thereof for applying pressure to said molten metal and being constructed to minimize the volume of molten metal in said reservoir outside said bell, maximize the change in level of the molten metal outside said bell in response to a change in bell pressure, provide a substantially constant pressure at said orifice and provide a nearly instantaneous on-off capability to interrupt extrusion, said pressure bell being inverted, disposed in said reservoir, spaced from the bottom surface thereof and having its side walls partially immersed below the level of molten metal contained in said reservoir; and said extrusion means further comprising:

(1) a gas regulator for regulating a quantity of inert gas in said bell to selectively apply pressure on the surface of the molten metal contained therein;

(2) a pressure sensor for sensing the pressure of the gas within said bell;

(3) level detection means for sensing a preselected height of the molten metal contained in said reservoir outside said bell, which corresponds to a preselected pressure head;

(4) first control means for maintaining a substantially constant pressure at said nozzle orifice by controlling the quantity of gas in said bell in response to said level detection means to thereby provide said substantially constant pressure at said nozzle orifice; and

(5) second control means for maintaining the level of the molten metal within said bell by controlling an input flow of molten metal to said reservoir in response to said pressure sensor.

3. A method for the continuous casting of continuous filaments of glassy metal alloy, comprising:

(a) moving a chill surface of a chill roll, having cooling means for quenching a continuous flow of molten metal at a quench rate sufficient for glass formation, past a nozzle which has an orifice disposed so as to direct a stream of molten metal onto the chill surface of said chill roll; and

(b) continuously and indefinitely extruding molten metal through said nozzle orifice at a substantially constant pressure from a non-pressurized reservoir, which contains molten metal and communicates with said nozzle, by application of pressure to a portion of said molten metal within a pressure bell disposed internally of said reservoir, the volume of molten metal within said bell being much greater than the volume of molten metal in said reservoir outside said bell, while maintaining a nearly instantaneous on-off capability to interrupt said extrusion, said pressure bell being inverted, spaced from the bottom surface of said reservoir, and having its side walls at least partially immersed below the level of the molten metal contained in said reservoir, and said extrusion step further comprising the steps of

(1) regulating a quantity of inert as in said bell to selectively apply pressure on the surface of the molten metal contained therein;

(2) sensing the pressure of the gas within said bell;

(3) sensing a preselected height of molten metal contained in said reservoir outside said bell, which corresponds to a preselected pressure head;

(4) maintaining a substantially constant pressure at said nozzle orifice by controlling the quantity of gas in said bell in response to changes from said preselected molten metal height outside of said bell to thereby provide said substantially constant pressure at said nozzle orifice; and

(5) maintaining the level of the molten metal within said bell by controlling an input flow of molten metal to said reservoir in response to the gas pressure within said bell.

4,449,569

METHOD AND APPARATUS FOR REGULATING FLUID FLOWS IN PARALLEL-CONNECTED CONDUITS (E.G. IN FURNACE INSTALLATIONS HAVING AIR PREHEATERS AND BY-PASS CONDUITS)

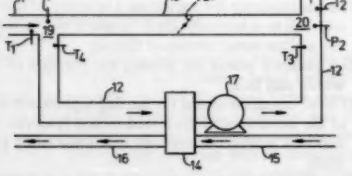
Edward L. Lisi, Morristown, N.J.; Juul A. Melleby, and Arne Andersson, both of Tolvsroed, Norway, assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Mar. 8, 1982, Ser. No. 354,920

Claims priority, application United Kingdom, Mar. 24, 1981, 8109212

Int. Cl.[3] **G05D** *23/00, 15/00;* **B60H** *1/00;* **F28F** *27/00*

U.S. Cl. 165—1 **8 Claims**



1. A method of regulating fluid flow from a first conduit via a second conduit including an air preheater and fluid-propelling means to a third conduit wherein a fourth conduit extends between the (first) junction of the first and second conduits and the (second) junction of the second and third conduits, the method comprising sensing the fluid temperature T_1, in the first conduit adjacent the first junction, sensing the fluid temperature T_2 in the third conduit adjacent the second junction, sensing the fluid temperature T_3 in the second conduit adjacent the second junction, sensing the fluid temperature T_4 in the second conduit adjacent the first junction, and providing power to said fluid-propelling means to propel fluid through the second conduit in an amount sufficient to overcome the fluid pressure drop in said air-preheater and in accordance with the summation of $(T_1-T_4)-(T_2-T_3)$ to modulate the amount of power to said fluid-propelling means and thereby regulate the relative flows of fluid through the second and fourth conduits.

4,449,570

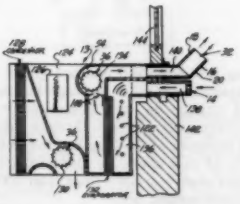
AIR CIRCULATION APPARATUS

Howard W. Locker, 820 N. Ocean Blvd., Delray Beach, Fla. 33444

Continuation of Ser. No. 91,095, Nov. 5, 1979, abandoned, which is a continuation-in-part of Ser. No. 17,412, Mar. 5, 1979, abandoned, which is a continuation-in-part of Ser. No. 817,222, Jul. 20, 1977, Pat. No. 4,142,456. This application Nov. 2, 1981, Ser. No. 317,075

Int. Cl.[3] **F24F** *7/00*

U.S. Cl. 165—65 **5 Claims**



1. A portable elongated air circulation apparatus comprising an elongated parallelepipedonal enclosure having four elongated sides and two opposite end walls, an electrically driven elongated tangential flow impeller circulating air from an inlet disposed in a first elongated side of said enclosure to an outlet disposed in a second elongated side of said enclosure, said first and second sides being consecutive elongated sides of said enclosure, a shroud surrounding partially said elongated tangential flow impeller for directing air circulated through said enclosure by said elongated tangential flow impeller from said inlet to said outlet, a support base having a pair of lateral flanges, means connecting said enclosure end walls and said flanges for adjustably positioning said enclosure relative to said support base around a longitudinal axis of said enclosure for orienting said outlet in an appropriate direction, and throttle means for gradually throttling the flow of air through said inlet, wherein said inlet is in the form of a rectangular box-like duct provided with at least one row of regularly disposed stationary nozzles dividing the flow of air through said outlet into separate diverging air streams, said nozzles have substantially parallel opposite sidewalls, said nozzles are substantially square in section and have longitudinal axes mutually disposed at a constant predetermined angle, said constant angle being in the range of about 15° to about 30°, and said nozzles are formed between two opposite parallel sidewalls of said duct by wedge-shaped rigid and stationary fin members each having a flat outer face of a width equal to at least one-half the width of each of said nozzles and a pair of rearwardly converging sidewalls forming an angle equal to the angle of divergence of said nozzles, wherein said throttle means comprises at least one substantially rectangular plate hinged at a longitudinal edge relative to said enclosure at said inlet, said plate being controllably and progressively hingedly movable from a position masking a substantial area of said inlet to a position substantially unmasking said inlet.

4,449,571

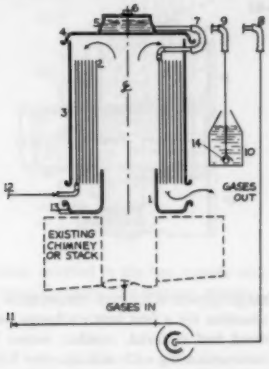
HEAT RECOVERY SYSTEM

Arthur R. Kramert, 1410 Del Rio Rd., Roseburg, Oreg. 97470

Continuation-in-part of Ser. No. 187,091, Aug. 25, 1980, abandoned, which is a continuation-in-part of Ser. No. 17,485, Mar. 5, 1979, abandoned. This application Nov. 16, 1981, Ser. No. 321,189

Int. Cl.³ F28F 00/00

U.S. Cl. 165—1 1 Claim



1. A method for recovery of wasteheat from any source by placing a gas to liquid exchanger atop a chimney or stack within a housing providing for routing all the gases through the exchanger which has the requisite area, all its surfaces directly in the gas stream and low by-pass factor to maximize approach; extracting all the latent heats in the condensibles; and orienting the surface so that wetting by the condensates is exploited to further enhance the total heat transfer;

wherein the improvement lies in locating such an efficient exchanger at the apex of a chimney or stack so that the entire column of gases below remains hot and—thus without loss of natural draft—recovery of heat is constrained only by the temperature level of the liquid side.

4,449,572

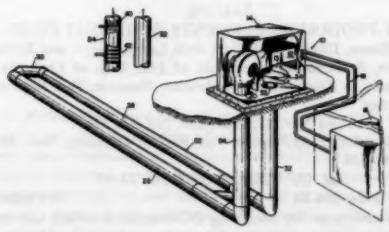
SUBTERRANEAN HEATING AND COOLING SYSTEM

Roland Lambert, Longwood, Fla., assignor to Ladek Corporation, Longwood, Fla.

Division of Ser. No. 248,427, Mar. 27, 1981, Pat. No. 4,369,635, which is a continuation-in-part of Ser. No. 51,405, Jun. 25, 1979, Pat. No. 4,279,291. This application Jan. 24, 1983, Ser. No. 460,186

Int. Cl.³ F24J 3/02

U.S. Cl. 165—1 3 Claims



1. A method of heating or cooling a building utilizing a heat exchanger and a source of forced air for passing over said heat exchanger, said method comprising the steps of:

providing an underground pathway for air travel, said pathway having an inlet and an outlet;

locating said heat exchanger in said underground pathway;

forcing a quantity of air through said pathway;

recycling a portion of the air traveling along said pathway;

increasing the velocity of said recycled air as the latter commences travel along said pathway; and

directing air emanating from said pathway outlet to said building.

4,449,573

REGENERATIVE HEAT EXCHANGERS

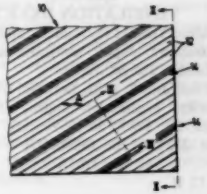
Birger Pettersson, Älta, and Kurt Karlsson, Tyresö, both of Sweden, assignors to Svenska Rotor Maskiner Aktiebolag, Nacka, Sweden

Continuation of Ser. No. 38,567, May 14, 1979, abandoned, which is a continuation of Ser. No. 785,586, Apr. 7, 1977, abandoned, which is a continuation of Ser. No. 641,307, Dec. 16, 1975, abandoned, which is a continuation of Ser. No. 473,823, May 28, 1974, abandoned, which is a continuation of Ser. No. 176,141, Aug. 30, 1971, abandoned, which is a continuation-in-part of Ser. No. 45,135, Jun. 10, 1970, abandoned. This application Apr. 30, 1982, Ser. No. 373,434

Claims priority, application United Kingdom, Jun. 16, 1969, 30314/69; Nov. 2, 1970, 51926/70

Int. Cl.³ F28D 19/04

U.S. Cl. 165—10 27 Claims



1. A pack of heat transfer plates for regenerative air preheaters comprising a plurality of superimposed profiled plates, each pair of plates together forming elongated, substantially straight open-ended channels for substantially free flow therethrough in either direction of heat exchanging fluids substantially without deflecting the straight flowing heat exchanging fluids flowing through said open-ended channels from their substantially straight flow path, said channels extending between two opposite end surfaces of the pack and being closed on their sides by said pair of adjacent plates, each plate being provided with a plurality of spaced sets of straight continuous parallel double ridges extending obliquely to said end surfaces from one edge of the plate to another, the double ridges of each set having opposed crests protruding symmetrically from both opposite sides of each of said plates, adjacent sets of double ridges of each of said plates being separated by separating plate portions of a width greater than the height of said double ridges above the median plane of the plate, said double ridges each having an interior wall defined by an intermediate contact pressure resisting web portion joining the opposed crests of the double ridge, said intermediate web portion being steeply sloping relative to said median plane of the plate to effectively resist the contact pressure between said superimposed plates, each ridge of said double ridges having an outer wall which extends from the respective crest to the separating plate portion adjacent the respective crest, said outer walls symmetrically sloping relative to said separating plate portion and having a substantially lower slope relative to said median plane than said intermediate web portion, said separating plate portions being provided with undulations substantially parallel with the ridges, said undulations having a ratio of undulation height over the middle plane of the plate to undulation pitch amounting to 0 to 1/6, and said plates being so disposed relative to each other that the ridges of one plate lie transverse to the ridges of adjacent plates so that the ridges of the adjacent plates cross each other at respective crossing portions of the

crests of the ridges thereof, and said adjacent plates supporting each other solely by direct contact at the crossing portions of the crests of the ridges to form said flow channels between adjacent plates, the angle between the ridges and said end surfaces of the plate pack being between 40° and 75°, and being smaller than 75° when said ratio is equal to 0 and smaller than 70° when said ratio is greater than 0,

whereby each time a heat exchanging fluid flowing in a given flow channel reaches a crossing portion of the crests of the ridges of adjacent plates, the fluid is split up into sub-flows, one sub-flow portion flowing to an adjacent flow channel to at least partly be mixed with the fluid of said adjacent flow channel, and another sub-flow portion remaining in said given flow channel.

4,449,574

VENTILATION DEVICE

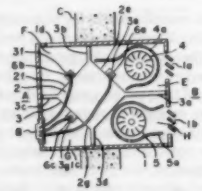
Masataka Yoshino; Yoshiki Hashimoto, and Yasunori Ushikosi, all of Nakatsugawa, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 2, 1982, Ser. No. 394,863

Claims priority, application Japan, Oct. 23, 1981, 56-157997[U]; Oct. 23, 1981, 56-157998[U]; Oct. 23, 1981, 56-157999[U]; Oct. 23, 1981, 56-158000[U]

Int. Cl.³ G01K *13/00*

U.S. Cl. 165—11 R **4 Claims**



1. A ventilation device including a heat-exchanging means, said heat-exchanging means including an air-feeding passage having an inlet and an outlet and an air-discharging passage having an inlet and an outlet, comprising:

a first thermosensitive element placed at said inlet of said air-feeding passage to detect an outdoor air temperature;

a second thermosensitive element placed at said outlet of said air-feeding passage such that a fed air temperature is detected after the outdoor air has been thermally conditioned by said heat-exchanging means as the outdoor air circulates through said air-feeding passage of said heat-exchanging means;

a third thermosensitive element placed at said inlet of said air-discharging passage such that a room air temperature is detected prior to the room air being thermally conditioned by said heat-exchanging means as the room air circulates through said air-discharging passage of said heat-exchanging means to exit via said outlet of said air-discharging passage; and

a display unit for showing said outdoor air temperature, said fed-air temperature and said room air temperature detected by said first thermosensitive element, said second thermosensitive element and said third thermosensitive element, respectively.

4,449,575

FLUIDIZED BED HEATING APPARATUS

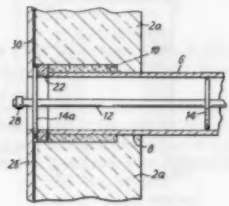
William R. Laws, 19 Tudor Ave., Worcester Park, Surrey, and Geoffrey R. Reed, 8 Beechdene, Tadworth, Surrey, both of England

Filed Mar. 27, 1981, Ser. No. 248,043

Claims priority, application United Kingdom, Mar. 28, 1980, 8010442

Int. Cl.³ F28F *7/00, 9/04*

U.S. Cl. 165—82 **12 Claims**



1. Heat exchange apparatus for high temperature gas heating comprising a chamber for a first heat exchange medium containing a fluidised bed material, conduit means below said chamber and communicating with said chamber for the supply of fluidising and combustion material to said chamber for maintaining fluidised bed combustion in said chamber as a heating medium, a multiplicity of ceramic tubes for a gaseous medium to be heated extending through the fluidised bed in said chamber to opposite and mutually transverse pairs of side walls bounding said chamber, each said side wall comprising a series of parallel ceramic blocks superimposed on each other edge to edge, recesses formed in said edges of the blocks providing seatings between adjacent blocks for said ceramic tubes extending through the chamber, sealing means in said seatings for sealing between the ends of the tubes and the side walls, said tubes being arranged in a series of banks at different levels in said chamber and sucessive banks of tubes at successive levels extending transversely to each other, whereby the seatings at said successive levels are provided in alternate pairs of said mutually transverse pairs of side walls of the chamber, said sealing means comprising flexible seal elements engaging the end faces of the tubes and retaining means bearing on said seal elements at their axially outer ends.

4,449,576

HEAT-PRODUCING ELEMENTS WITH HEAT PIPES

Walter Baum, Hanover; Michael Still, Langenhagen, and Erich Becker, Seeheim-Jugenheim, all of Fed. Rep. of Germany, assignors to Kabel- und Metallwerke, Hanover, Fed. Rep. of Germany

Filed Nov. 27, 1981, Ser. No. 325,574

Claims priority, application Fed. Rep. of Germany, Nov. 25, 1980, 3044314

Int. Cl.³ F28D *15/00*; H01L *23/42*

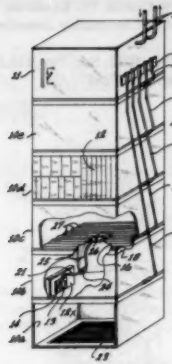
U.S. Cl. 165—104.33 **10 Claims**

1. An enclosure for receiving PC-boards, of which one or more carry at least one electric or electronic power element that develops significant amounts of heat, comprising:

the enclosure being air-tightly sealed, and having a top, there being ducts in the top filled with an evaporating working fluid;

first means including a working fluid containing tubular or

hollow means disposed for conducting thermal energy from the interior of the enclosure to said top; and



second means coupled to the top outside said enclosure for removing said conductive thermal energy.

4,449,577

METHOD OF STORING ENERGY AND SYSTEM FOR CARRYING OUT THIS METHOD

Hannes Alfvén, Lillängsvägen 3, S-183 64 Täby; Nicolai Herlofson, Marknadsvägen 291 NB, S-183 34 Täby; Miroslav Babic, Kallkärrsvägen 1, S-141 41 Huddinge, and Ernst-Ake Brunberg, Frejavägen 34, S-182 64 Djursholm, all of Sweden

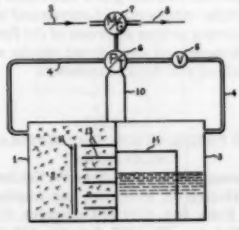
PCT No. PCT/SE80/00314, 371 Date Jul. 31, 1981, 102(e) Date Jul. 31, 1981, PCT Pub. No. WO81/01726, PCT Pub. Date Jun. 25, 1981

PCT Filed Dec. 4, 1980, Ser. No. 287,749

Claims priority, application Sweden, Dec. 11, 1979, 7910174

Int. Cl.³ F28D *21/00*

U.S. Cl. 165—104.12 **8 Claims**



1. Method for the storing of energy in a two-vessel system, whose one vessel contains a first substance which comprises two components, one of which is driven off and is brought to become absorbed, respectively, by the other component at the supply of energy to and the withdrawal of energy from the system, respectively, said method comprising the steps of storing mechanical energy in the system by pumping said one component out of said one vessel and into the other vessel, while maintaining the two vessels of the system substantially in thermal equilibrium with each other, and maintaining a substantially higher pressure in said other vessel than in said one vessel during said storing of mechanical energy.

4,449,578

DEVICE FOR RELEASING HEAT

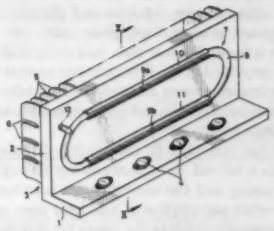
Masaaki Munekawa, Tochigi, Japan, assignor to Showa Aluminum Corporation, Osaka, Japan

Filed Jun. 12, 1981, Ser. No. 273,087

Claims priority, application Japan, Jun. 16, 1980, 55-84452[U]; Jun. 16, 1980, 55-84453[U]; Jun. 16, 1980, 55-84454[U]

Int. Cl.³ F28D *15/00*; H01L *23/42*

U.S. Cl. 165—104.33 **3 Claims**



1. A device for releasing heat comprising an extruded aluminum main body having a predetermined cross section and including a horizontal wall to serve as a portion for attaching heat emitting elements thereto and a vertical wall to serve as a finned portion, and a heat pipe portion provided on one side of the vertical wall, the vertical wall being formed with fins on at least one of its opposite sides to serve as the finned portion, said fins being integral with the main body and formed by gouging the main body at a multiplicity of locations spaced apart by a specified distance, the heat pipe portion being provided by a looped pipe having a vacuum interior and containing a working fluid enclosed therein.

4,449,579

COOLING APPARATUS FOR A CLOSED HOUSING

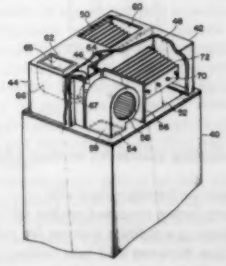
Yoshiro Miyazaki, Tokyo; Toshio Yasunaga, and Tomiya Sasaki, both of Yokohama, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Jan. 20, 1982, Ser. No. 341,055

Claims priority, application Japan, Jan. 30, 1981, 56-11509

Int. Cl.³ F28D *15/00*

U.S. Cl. 165—104.33 **7 Claims**



1. A cooling apparatus for a housing which is provided with an opening at the upper part thereof, comprising:

a casing located on the upper part of the housing and including a bottom plate to close the opening and a chamber;

a partition wall provided in the casing to divide the chamber into a first chamber section and a second chamber section;

said bottom plate having a first inlet opening and a first outlet opening, said first chamber section communicating with the interior of the housing by means of the first inlet opening and the first outlet opening, and said casing hav-

ing a second inlet opening and a second outlet opening, said second chamber section communicating with the exterior of the housing by means of the second inlet opening and the second outlet opening;

heat exchange means including a plurality of heat pipes provided in the casing through the partition wall with coolant therein for exchanging heat in the first chamber section with heat in the second chamber section, each of said heat pipes having one end portion in the second chamber section above the first inlet opening and the other end portion in the second chamber section under the second inlet opening, wherein said plurality of heat pipes are disposed in an inclined plane such that said one end portion is located lower than said other end portion;

a first fan provided in the first chamber section to generate a first air stream passing through the first inlet opening and the first outlet opening and passing by the one end portion of the heat pipe;

a second fan provided in the second chamber section to generate a second air stream passing through the second inlet opening and the second outlet opening and passing by the other end portion of said heat pipe; and

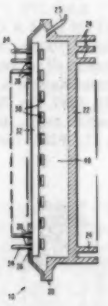
driving means provided in the casing for driving the first and second fans.

4,449,580

VERTICAL WALL ELEVATED PRESSURE HEAT DISSIPATION SYSTEM

Arnold Reisman; Melvin Berkenblit, both of Yorktown Heights, and Charles J. Merz, III, Hopewell Junction, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 30, 1981, Ser. No. 280,149
Int. Cl.³ F28D *15/00*; H01L *23/46*
U.S. Cl. 165—104.34 **15 Claims**



1. A heat dissipating system for cooling a heat source comprising:

an encased module having side walls;

said heat source being mounted within said encased molule such that there is a definite spacing for promoting a natural convection between said heat source and said module side walls, said heat source being at a desired operating temperature;

the temperature of the walls of said encased module being lower than said operating temperature of said heat source; and

a gas at an elevated pressure for promoting said natural convection, and being contained within said encased module for providing an enhanced thermal coupling between said heat source and the walls of said encased module primarily by natural convection of said gas;

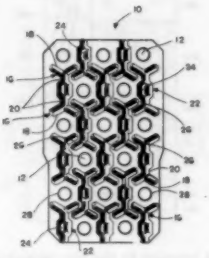
whereby heat removal from said heat source is increased.

4,449,581

HEAT EXCHANGER FIN ELEMENT WITH DOG-BONE TYPE PATTERN OF CORRUGATIONS

Wayne G. Blystone, and Gerald W. Lemmon, both of Mount Vernon, Ill., assignors to Chromalloy American Corporation, St. Louis, Mo.

Filed Aug. 30, 1982, Ser. No. 413,246
Int. Cl.³ F28F *1/32*
U.S. Cl. 165—151 **7 Claims**



1. A heat exchanger core assembly adaptable for allowing the passage of a first fluid medium therethrough comprising a plurality of substantially parallel tubular members extending through said core assembly, a plurality of spaced apart fin elements having a plurality of openings extending therethrough adapted for receiving said tubular members, said tubular members being disposed through said fin openings and adapted for receiving and carrying a second fluid medium therewithin, said fin elements being disposed in a substantially parallel relationship with each other and each pair of said fin elements defining a passageway therebetween for allowing said first fluid medium to flow therethrough, each of said fin elements having oppositely facing surfaces associated therewith and each including a uniform discontinuous corrugated surface pattern extending in surrounding relationship around each of said tubular members, each of said corrugated patterns being displaced from the general plane of said fin elements so as to form a discontinuous six-sided shaped indentation around each of said tubular members on one of said fin surfaces and a corresponding discontinuous six-sided shaped projection around each of said tubular members on the other of said fin surfaces, each respective side of said six-sided shaped indentations and projections extending in a non-radial pattern around each of said tubular members, said corrugated surface patterns operatively directing at least a portion of the first fluid medium over said fin elements and around said tubular members to the downstream side of said tubular members.

4,449,582

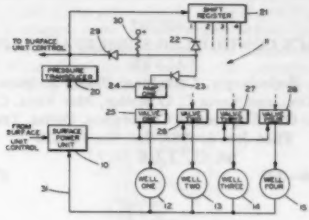
SEQUENCED PRODUCTION INCORPORATING FLUID ROD PUMP

Daniel G. Peterson, Los Angeles; John W. Erickson, Huntington Beach, and Horace M. Robinson, Los Angeles, all of Calif., assignors to Kobe, Inc., City of Commerce, Calif.

Filed Aug. 23, 1982, Ser. No. 410,300
Int. Cl.³ E21B *43/00*
U.S. Cl. 166—64 **8 Claims**

1. An apparatus for pumping production fluid from a plurality of subterranean wells, a common source pump means, a plurality of downhole pump means with one of said downhole pump means in each of said wells, a plurality of valve means having input and output means, means connecting said common source pump means to the input means of each of said valve means, means for connecting the output means of one of said valve means to one of said downhole pump means for each of said plurality of downhole pump means, means for generating sequential electronic signals for enabling each of valve means in a predetermined sequence, means for connecting one

of said enabling signals to one of said valve means for each of said plurality of valve means, each of said valve means being responsive to an associated one of said enabling signals to connect said common source pump means to said downhole



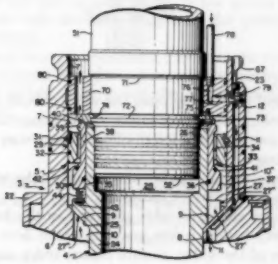
pump means in said predetermined sequence to produce cycles of pressurized fluid, and means for disabling said enabling signals connected to said means for connecting said enabling signals.

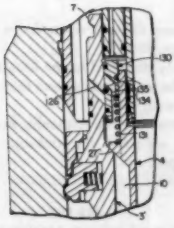
4,449,583

WELL DEVICES WITH ANNULUS CHECK VALVE AND HYDRAULIC BY-PASS

John E. Lawson, London, England, assignor to ARMCO Inc., Middletown, Ohio

Filed Sep. 21, 1981, Ser. No. 304,078
Int. Cl.³ E21B *34/10, 34/12*
U.S. Cl. 166—72 **31 Claims**





25. A well having an annulus check valve, the combination comprising:

a well head lower body having a vertical bore therein;

an upper tubular member receivable on said well head lower body;

a hanger member supported in said vertical bore;

a hanger mandrel supported in said hanger member and having tubing extending downwardly therefrom;

said hanger mandrel and hanger member being spaced to define a fluid passageway therebetween;

a normally closed check valve, including a longitudinally slidable, annular valve member, located in and spanning said fluid passageway to prevent fluid flow in said fluid passageway; and

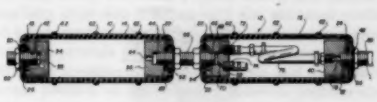
means, carried by said upper tubular member, for opening said check valve when said upper tubular member is received on said well head lower body.

4,449,584

INFLATABLE FLOWING HOLE PLUG

Byron Christensen, Box 626, Innisfail, Alberta, Canada (T0M 1A0)

Filed Aug. 12, 1982, Ser. No. 407,580
Int. Cl.³ E21B *33/127*
U.S. Cl. 166—187 **14 Claims**



1. A flowing hole plug system, comprising:

(a) two longitudinally and laterally extensible fluid inflatable hole plugs, including an upper plug and a lower plug;

(b) flexible extensible duct means disposed in said upper plug;

(c) first means for connecting said upper plug to a fluid supply line;

(d) second means for connecting said plugs so as to allow fluid communication between said plugs;

(e) said duct means disposed in said upper plug connecting said first and second means; and,

(f) valve system means disposed in said upper plug for controlling inflation of said upper and lower plugs.

4,449,585

APPARATUS AND METHOD FOR IN SITU CONTROLLED HEAT PROCESSING OF HYDROCARBONACEOUS FORMATIONS

Jack E. Bridges, Park Ridge, and Allen Taflove, Wilmette, both of Ill., assignors to IIT Research Institute, Chicago, Ill.

Filed Jan. 29, 1982, Ser. No. 343,903
Int. Cl.³ E21B *43/24*
U.S. Cl. 166—248 **58 Claims**

1. A method for the controlled in situ heat processing of hydrocarbonaceous earth formations comprising the steps of:

placing a plurality of electrodes into a particular volume of hydrocarbonaceous material in a pattern which bounds said volume and defines a waveguide structure having said bounded volume present as a dielectric medium bounded therein, and which is configured such that the direction of propagation of aggregate modes of wave propogation therein is approximately parallel to an elongate axis of said electrodes, said structure having first and second axially displaced ends;

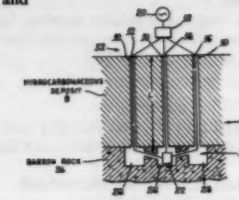
supplying electromagnetic energy to said waveguide structure at a frequency selected to confine said electromagnetic energy substantially in said structure and to dissipate said electromagnetic energy substantially to the earth formations; and

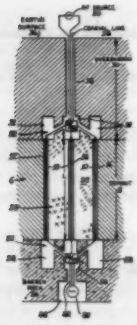
terminating one end of said structure with different effective termination impedances at different times to produce electric field standing waves of different respective phase at said one end at the selected frequency.

51. A system for the controlled in situ heat processing of hydrocarbonaceous earth formations, comprising

a waveguide structure comprising a plurality of elongate electrodes and configured such that the direction of propagation of aggregate modes of wave propagation therein is approximately parallel to an elongate axis of said electrodes and bounding a particular volume of earth forma-

tions as a dielectric medium bounded therein, said structure having respective first and second axially separated ends; and





means for supplying electromagnetic energy to said waveguide structure at each of said ends thereof at a frequency selected to confine said electromagnetic energy substantially in said structure and to dissipate said electromagnetic energy substantially to the earth formations.

4,449,586

PROCESS FOR THE RECOVERY OF HYDROCARBONS FROM OIL SHALE

Peter Urban, Northbrook; Russell W. Johnson, Villa Park, and Lee Hilfman, Mt. Prospect, all of Ill., assignors to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 378,024, May 13, 1982. This application Jun. 11, 1982, Ser. No. 387,404

Int. Cl.³ C10G *1/04;* E21B *43/24*

U.S. Cl. 166—303 **15 Claims**

1. A process for the recovery of hydrocarbons from oil shale containing hydrocarbons which comprises:

(a) heating said shale in the presence of a gas comprising hydrogen sulfide at subcritical conditions of said gas including a temperature from about 650° F. to about 825° F. to produce a solvent extractable material and to liberate at least a first portion of the hydrocarbon contained therein; and

(b) contacting the resulting solvent extractable material with a normally-liquid solvent at subcritical, reflux conditions of said solvent to liberate at least a second portion of the hydrocarbon contained in said solvent extractable material.

14. A process for the in situ recovery of hydrocarbons from oil shale containing hydrocarbons which comprises:

(a) heating said shale in the presence of gas comprising hydrogen sulfide at subcritical conditions of said gas including a temperature from about 650° F. to about 825° F. to produce a solvent extractable material and to liberate at least a first portion of the hydrocarbon contained therein; and

(b) contacting the resulting solvent extractable material from step (a) with a normally-liquid solvent at subcritical, reflux conditions of the solvent including a temperature from about 100° F. to about 900° F. and a pressure from about atmospheric to about 2000 psig to liberate at least a second portion of the hydrocarbon contained in the solvent extractable material.

4,449,587

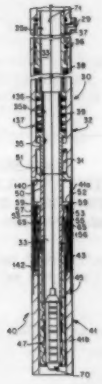
SURFACE CONTROLLED SUBSURFACE SAFETY VALVES

Charles M. Rodenberger, Carrollton; Phillip S. Sizer, Dallas, both of Tex., and Kevin C. O'Malley, Mar Vista, Calif., assignors to Otis Engineering Corporation, Dallas, Tex.

Filed Jan. 6, 1983, Ser. No. 456,333

Int. Cl.³ E21B *34/10*

U.S. Cl. 166—323 **17 Claims**



1. A well tool for locking open the valve closure means of a surface controlled subsurface safety valve, comprising:

a. housing means with a longitudinal passageway extending therethrough;

b. means for attaching the housing means to the safety valve below its valve closure means;

c. a lock-open sleeve slidably disposed in the longitudinal passageway having a first position which does not affect operation of the valve closure means and a second position which holds the valve closure means in its open position;

d. means for releasably securing the lock-open sleeve in its first position;

e. means for biasing the lock-open sleeve to shift from its first to its second position;

f. a sleeve slidably disposed in the longitudinal passageway;

g. a portion of the lock-open sleeve telescoped partially into the sliding sleeve; and

h. means for contacting the releasable securing means by the sliding sleeve whereby the lock-open sleeve is released from its first position.

4,449,588

FIRE EXTINGUISHER MOUNTING UNIT

Leon Benlolo, 9370 NW. 13th St., Plantation, Fla. 33322, and Carl O. Tolf, Jr., 300 Delnor Ave., St. Charles, Ill. 60174

Filed Jan. 18, 1982, Ser. No. 339,853

Int. Cl.³ A62C *25/00*

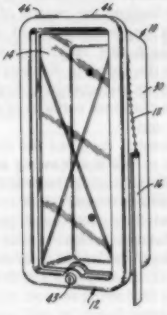
U.S. Cl. 169—48 **2 Claims**

1. A fire extingusher mounting unit including a cabinet, a frame and an access panel, said cabinet and frame being formed from a flame retardant, high impact plastic with said access panel being formed of a grooved acrylic sheet,

said cabinet being generally rectangular and having a rear wall and four tapered side walls integral therewith, each of said side walls having an offset ledge remote from the

rear wall thereof, with the interior surface of said ledge being generally continuous and providing a support for mounting said access panel,

said frame having a generally U-shaped cross section with the outer edge of said side walls extending into the open side of said frame generally the entire depth of said generally U-shaped cross section frame when the frame is mounted upon said access panel and cabinet, the interior wall of said frame having an inwardly-extending flat portion which is positioned against the exterior of said access



panel with the interior surface of said ledge and the inward side of said frame inwardly-extending flat portion being spaced apart a distance generally equal to the thickness of said access panel whereby the access panel is held between said inwardly-extending flat portion and said offset ledge,

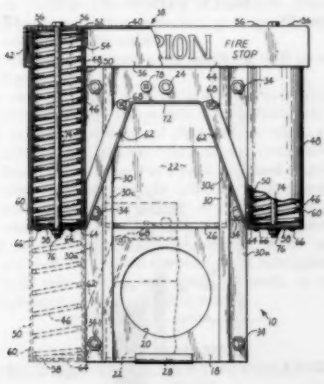
said cabinet being mountable either with the rear wall positioned against a support or recessed whereby the exterior of said offset ledge is peripherally positioned against a support.

4,449,589

FIRE CONTAINMENT DEVICE AND METHOD

John T. McCoy, 613 N. 5th St., Kansas City, Kans. 66101

Filed Oct. 16, 1981, Ser. No. 312,142
Int. Cl.³ A62C 7/00
U.S. Cl. 169—48 **5 Claims**



1. Fire containment apparatus operable under fire conditions to close a building opening which extends through a building surface and which receives a fusible member such as a conduit or the like, said apparatus comprising:

a plate member adapted to be mounted to the building surface and having an opening for alignment with the building opening to permit the conduit to extend through the aligned openings with the aligned openings providing the sole passage through the building surface;

a blade having a cutting edge adapted to cut through the condut;

means for mounting said blade on the plate member in a manner to slide thereon between a normal position wherein the blade is offset from said opening in the plate member and an activated position wherein said blade covers the opening in the plate member, said blade being held closely against said plate member in the activated position to completely close the aligned opeings;

means for forcefully biasing said blade toward the activated position thereof,

said biasing means including a spring acting in a manner to forcefully urge said blade toward the activated position and a fire resistant tube substantially enclosing said spring therein to provide a heat shield for the spring;

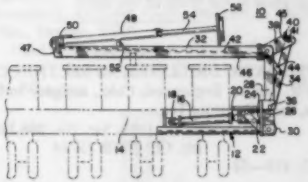
temperature sensitive means for holding said blade in the normal position at temperatures below a predetermined level indicative of fire conditions, said temperature sensitive means releasing the blade when said preselected temperature level is reached, whereby under fire conditions the blade moves to the activated condition and cuts through the conduit under the influence of said biasing means to completely close the aligned openings to prevent fire from spreading through the building opening.

4,449,590

ROW MARKER ARM ASSEMBLY

Gerald E. Williamson, Macomb, Ill., assignor to Yetter Manufacturing Co., Colchester, Ill.

Filed Sep. 21, 1982, Ser. No. 420,800
Int. Cl.³ A01B 17/00
U.S. Cl. 172—126 **3 Claims**



1. An agricultural row marker assembly comprising:

a base member connectable to a tool bar;

a first arm pivotally connected to said base member;

a second arm having a first end, a second end and a tail piece fixed to the first end, said first end pivotally connected to said first arm;

a third arm pivotally connected to the second end of said second arm and having a row marker device mounted on said third arm;

a hydraulic cylinder mounted to said base and including an extendable rod;

a first link having one end pivotally mounted to said extendable rod and another end pivotally mounted to said first arm;

a second link having one end pivotally mounted to said base and another end having a pin pivotally and slidably mounted in an elongated slot defined in said tail piece, said slot aligned to permit vertical deflection of said row marker when the assembly is fully extended but not permitting lost motion when the assembly is being retracted; and

a cable having one end fixed to said second link at a point intermediate the two ends of said second link and another end fixed to said third arm whereby extension of said extendable rod urges said first arm into an extended posi-

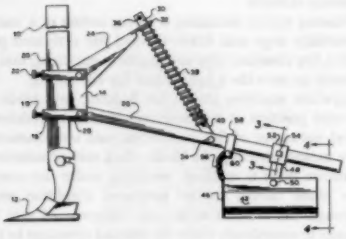
tion and applies tension to said cable urging said first, second and third arms into substantially linear alignment.

4,449,591

AGRICULTURAL CLEAN-OUT DRAG

George L. Brown, Idalou, Tex., and Lindell E. Lee, Jr., P.O. Box 402, Idalou, Tex. 79329, assignors to Lindell E. Lee, Jr., Idalou, Tex.

Filed Dec. 10, 1981, Ser. No. 329,293
Int. Cl.³ A01B *13/00*; E02F *5/02*
U.S. Cl. 172—195 **12 Claims**



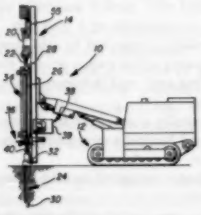
1. A drag for cleaning out agricultural furrows behind plows comprising:
   a. a semi-cylinder shell open at the back and top,
   b. a flat semi-circular plate attached to the front of the shell closing it,
   c. a bail pivoted to the shell rearward of the center of the shell,
   d. a boom adapted to be attached to a plow shank,
   e. said bail attached to the boom, and
   f. a flexible tension element extending from the boom to the flat plate at the front of the shell.

4,449,592

AUTOMATIC DRILL STRING SECTION CHANGER

James R. Mayer, Englewood, Colo., assignor to Cooper Industries, Inc., Houston, Tex.

Filed Mar. 23, 1981, Ser. No. 246,310
Int. Cl.³ E21B *19/14*
U.S. Cl. 175—52 **47 Claims**



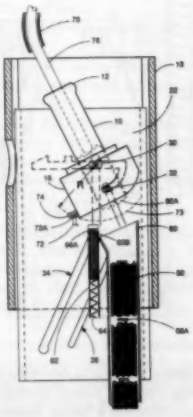
1. A storage rack for storing drill string sections for use with a drill unit having a mast, comprising:
   upper and lower support arms secured at spaced apart positions along the mast;
   a pivot shaft mounted between said upper and lower support arms to allow for pivotal motion;
   upper and lower swing arm members secured at first ends to said pivot shaft adjacent said upper and lower support arms, respectively;
   a center shaft rotatably mounted between said upper and lower swing arm members at the ends opposite said first ends;
   an upper rack member mounted for rotation to said center shaft adjacent said upper swing arm member and having four arms extending outwardly, each arm comprising a fixed finger having a generally planar inner surface for contacting a first side of a coupling on a drill string section, a clamping finger having a generally arcuate inner surface with a notch formed therein for contacting the opposite side of the coupling at least at two points, means pivotally mounting said clamping finger to said arm, spring means for biasing the inner surface of said clamping finger toward the inner surface of said fixed finger to form a clamp for clamping the coupling therebetween, and a fixed stop for limiting the motion of said inner surface of said clamping finger toward said inner surface of said fixed finger such that motion of said arm toward the coupling after the coupling contacts said fixed and clamping fingers pivots said clamping finger to admit the coupling between the inner surfaces of said fingers to clamp the coupling; and
   a lower rack member mounted for rotation to said center shaft adjacent to said lower swing arm member and having four arms extending outwardly, each arm being aligned with an arm in said upper rack member and comprising a fixed finger having a generally planar inner surface for contacting a first side of a drill string section, a clamping finger having an inner surface conforming to the cross sectional shape of the drill string section for contacting the drill string section, means pivotally mounting said clamping finger to said arm, spring means for biasing the inner surface of said clamping finger toward the inner surface of said fixed finger to form a clamp for clamping the drill string section therebetween, and a fixed stop for limiting the motion of said inner surface of said clamping finger toward said inner surface of said fixed finger such that motion of said arm toward a drill string section after the section contacts said fixed and clamping fingers pivots said clamping finger to admit the drill string section between the inner surfaces of said fingers to clamp the section.

4,449,593

GUIDE FOR SIDEWALL CORING BIT ASSEMBLY

Alfred H. Jageler; Gary D. Bruce, and Houston B. Mount, II, all of Tulsa, Okla. 74135, assignors to Standard Oil Company, Chicago, Ill.

Filed Sep. 29, 1982, Ser. No. 426,304
Int. Cl.³ E21B *49/06*
U.S. Cl. 175—58 **17 Claims**



1. An apparatus for drilling a sidewall core comprising:
   an elongated housing having an opening in the wall thereof;

a fixed plate means secured to said housing and having a guide slot substantially perpendicular to the longitudinal axis of the housing and an arcuate section at one end thereof;

a drive plate adjacent said fixed plate means and movable with respect to said housing and having a first and a second slot, said first slot having a first section parallel to the axis of said housing and a second section forming a selected angle with said first section;

said second slot having a lower section parallel to said second section and an upper section making a second selected angle with said lower section;

drive means to move said drive plate;

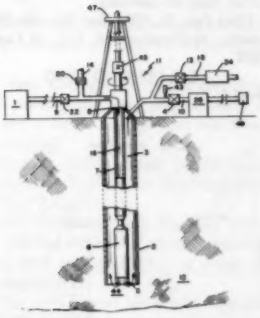
a bit assembly mounted to said housing and having guide means engaging said guide slot means and said first and second slot to extend and retract said assembly through said opening of said housing in response to the movement of said drive plate.

4,449,594

METHOD FOR OBTAINING PRESSURIZED CORE SAMPLES FROM UNDERPRESSURIZED RESERVOIRS

Ronald L. Sparks, Midland, Tex., assignor to Allied Corporation, Morris Township, Morris County, N.J.

Filed Jul. 30, 1982, Ser. No. 403,841
Int. Cl.³ E21B *25/08*
U.S. Cl. 175—59 **10 Claims**



1. A method for obtaining a balanced, pressurized core sample from an underpressurized geological reservoir formation, comprising the steps of:

(a) drilling a pressure core sampling well to a preselected depth;

(b) determining a bottom hole reservoir pressure at the bottom of said well which is to be balanced;

(c) drilling a pressurized core sample while a stable foam coring fluid, having a preselected composition, is introduced into said well at a predetermined empirically correlated control pressure selected to produce a resultant bottom hole foam pressure at the bottom of said well that substantially balances said reservoir pressure; and

(d) encapsulating said core sample, while said reservoir pressure within said core sample is substantially balanced with said bottom hole foam pressure, to produce said balanced, pressurized core sample.

4,449,595

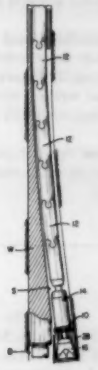
METHOD AND APPARATUS FOR DRILLING A CURVED BORE

Don R. Holbert, 6637 W. Hinsdale Ave., Littleton, Colo. 80123

Filed May 17, 1982, Ser. No. 378,786
Int. Cl.³ E21B *10/30*
U.S. Cl. 175—79 **12 Claims**

7. In apparatus for use in combination with a radial whipstock assembly wherein a drill bit is connected to the lower end of a rotary drill string for advancement along a guide surface of the whipstock in drilling a curved bore, the improvement comprising:

a reamer assembly rigidly connected to and directly behind said drill bit, said reamer assembly having a front stabilizer section directly connected to said drill bit and a plurality



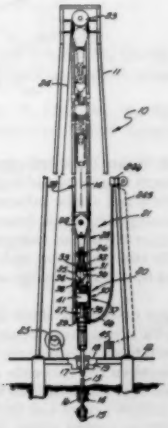
of cutter blades of a greater effective cutting diameter than said drill bit at a trailing end of said stabilizer section, each cutter blade having a leading end portion in facing relation to said drill bit and at least one cutting edge extending rearwardly in a direction away from said drill bit and from said leading end portion.

4,449,596

DRILLING OF WELLS WITH TOP DRIVE UNIT

George I. Boyadjieff, Anaheim, Calif., assignor to Varco International, Inc., Orange, Calif.

Filed Aug. 3, 1982, Ser. No. 404,896
Int. Cl.³ E21B *19/06*
U.S. Cl. 175—85 **40 Claims**



1. Well drilling apparatus comprising:

a top drive assembly to be received at the upper end of a drill string and which is movable upwardly and downwardly with the string;

said assembly including an element to be connected to the upper end of the string for rotation therewith and motor

means for power rotating said element and the connected string;

a powered torque wrench at the lower end of said assembly operable to apply torque in opposite directions to said string and said element;

an elevator at the lower end of said assembly adapted to engage a section of said drill string at a location beneath the torque wrench and suspend said section for movement by the elevator;

connecting means attaching said torque wrench and said elevator to said top drive assembly for movement upwardly and downwardly therewith and in a relation suspending said torque wrench and said elevator and a section of the drill string carried by the elevator from said top drive assembly;

said connecting means being constructed to enable movement of said torque wrench and elevator vertically relative to one another.

4,449,597

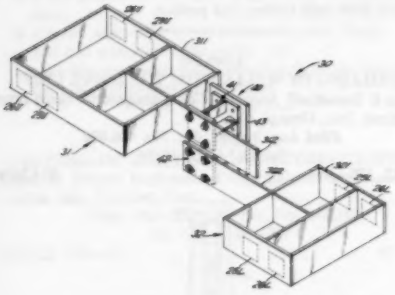
FLEXURE WEIGHING SYSTEM

Ronald J. Ricciardi, Woodcliff Lake, and Otto J. Rudolph, Oakland, both of N.J., assignors to Acrison, Incorporated, Moonachie, N.J.

Filed Apr. 23, 1982, Ser. No. 371,457

Int. Cl.³ G01G *21/08, 23/14, 23/06*

U.S. Cl. 177—256 **21 Claims**



1. A highly stable flexure based industrial weighing apparatus having a low center of gravity and high resistance to noise forces due to vibration and similar influences in the industrial work environment comprising a split-beam assembly including two beams, each beam having an interconnecting end and a load-bearing end, the interconnecting ends of said beams being flexurally connected by a flexure linkage assembly including at least two flexures,

a rectangular frame having two sidewalls and two endwalls with each sidewall connected to two points between the two ends of each beam by a flexure,

the two points between the two ends of each beam being equidistant from their respective end walls so that each set of two points defines a pivot axis for its respective beam,

a weighting platform located above the beams and connected to one end of each of a plurality of mounting studs,

the other end of each of the plurality of mounting studs being connected to the load-bearing end of one or the other of the beams, with the load-bearing end of each beam connected to at least one stud,

the plurality of mounting studs supporting the weighing platform and transmitting a load force from the weighing platform to the load-bearing ends of the beams when an object to be weighed is on the weighing platform,

each of the flexures connecting the frame to the beams comprising a plurality of cross-members spaced about the pivot axis for the beam so that each flexure is resistant to noise forces which are not applied parallel to the load force,

said load force causing each of the flexures connecting the frame to the beams to flex about its pivot axis thereby causing each of the beams to rotate slightly about its pivot axis, and

means for sensing vertical movement of a predetermined point proximate to the interconnecting end of one of the beams and producing a signal indicative of that movement and consequently indicative of the weight of the object placed upon the weighing platform.

4,449,598

METHOD AND APPARATUS FOR STEERING A VEHICLE WITH FIXED-POSITION WHEELS

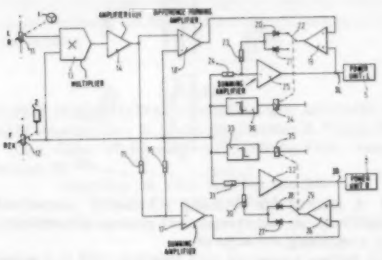
Helmut Hönes, Korntal, and Hubert Mohaupt, Bietigheim, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jun. 21, 1982, Ser. No. 390,205

Claims priority, application Fed. Rep. of Germany, Sep. 8, 1981, 13135485

Int. Cl.³ B62D *11/02*

U.S. Cl. 180—6.5 **12 Claims**



1. Method of steering a vehicle in a predetermined path which includes a curve, having right (R) and left (R) rotating drive elements or wheels (**8, 9**) at the sides of the vehicle, respectively, by controlling the speed and direction of rotation of the wheels, having

a steering wheel (**1**) and a steering wheel position transducer (**11**) coupled thereto and providing a right-left (R-L) turning signal;

a direction control element (**2**) and a control element position transducer (**12**) coupled thereto and providing a forward-reverse (F-REV) direction drive signal;

and separate drive motors (**6, 7**) controlling the respective rotation of the L and R wheels (**8, 9**),

comprising the steps of

multiplying the turning signal and the direction signal and obtaining a combined signal;

adding said combined signal to the direction signal and obtaining a first turning control direction signal;

subtracting said combined signal from the direction signal and obtaining a second turning control direction signal;

controlling the wheel at the inside of the curve by, selectively, the first or the second turning control direction signal, respectively, in dependence on the relative level thereof;

and controlling the wheel at the outside of the curve of the turning direction in dependence on the driving direction signal.

4,449,599

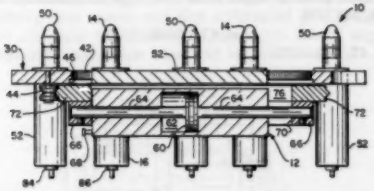
FINGER WALKER FOR TUBE SHEET

Ronald B. Creek, Chattanooga, Tenn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Sep. 27, 1982, Ser. No. 423,976

Int. Cl.³ B25J *5/02*; F28G *15/04*

U.S. Cl. 180—8.1 **7 Claims**



1. An apparatus for remotely traversing a flat surface having a regular array of identical openings on a uniform pitch, comprising:

a rectangular base having four base fingers disposed in a rectangular pattern, the base fingers being adapted to selectively and in unison engage with and disengage from respective openings;

base finger insertion means carried by the base for selectively moving said base fingers perpendicularly toward and away from the surface;

an annular platform surrounding the base and connected thereto by bearing means for relative rotational motion between the base and platform in a plane substantially parallel to the surface;

a plurality of platform fingers uniformly disposed about the platform, the platform fingers being adapted to selectively and in unison engage with and disengage from respective openings when said base fingers are engaged in respective openings;

platform finger insertion means carried by the platform for selectively moving said platform fingers perpendicularly toward and away from the surface; drive means for rotating the platform relative to the base;

means selectively advancing the platform relative to the base in increments of at least one pitch along the major axis of the base;

control connection means for receiving remote control signals to advance the apparatus one cycle such that,

(a) the platform fingers are inserted into and engaged with respective openings,

(b) the base fingers are withdrawn from the surface,

(c) the base is rotated within the platform until the major axis of the base is aligned with the intended direction of travel along the surface,

(d) the base fingers are inserted into and engaged with respective openings,

(e) the platform fingers are disengaged and withdrawn from the surface,

(f) the platform is advanced a pitch multiple relative to the base along the axis direction; and

(g) the platform fingers are inserted into and engaged with respective openings as in (a) above, whereby the entire apparatus has cycled.

4,449,600

MOBILE CRANES OR AERIAL LIFT PLATFORMS

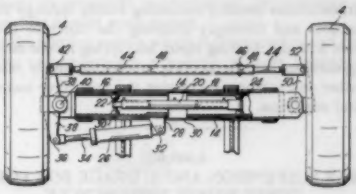
James D. Telfer, Sunderland, Great Britain, assignor to Coles Cranes Limited, England

Filed Aug. 27, 1981, Ser. No. 297,283

Claims priority, application United Kingdom, Sep. 3, 1980, 8028470

Int. Cl.³ B62D *21/14*

U.S. Cl. 180—132 **13 Claims**



1. A mobile weight lifting vehicle comprising a chassis and a weight lifting boom mounted thereto,

forward and rearward axle means mounted to said chassis,

wheel mounting means mounted to said forward and rearward axle means,

at least one said axle means being of variable track width and comprising a pair of coaxially housed sliding beams each carrying pivotally mounted thereon wheel mounting means at one end and mounted in an axle housing,

means for extending and retracting said sliding beams within said axle housing,

a steering arm mounted to each said wheel mounting means,

means for adjustably connecting the steering arms to one another,

a steering actuator having first and second ends, said first end mounted to one of said sliding beams and said second end mounted to one of said steering arms, whereby on extension or retraction of said variable track width axle the distance between the first and second ends remains the same.

4,449,601

POWER-ASSISTED STEERING GEAR ASSEMBLY

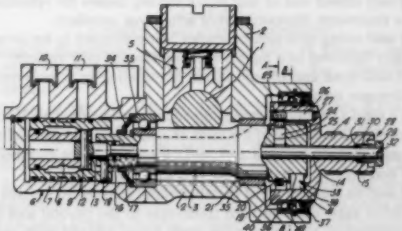
Frederick J. Adams, Clevedon, England, assignor to Cam Gears Limited, England

Filed May 28, 1982, Ser. No. 382,816

Claims priority, application United Kingdom, Jun. 3, 1981, 8117028

Int. Cl.³ B62D *5/08*

U.S. Cl. 180—148 **8 Claims**



1. A power assisted steering gear assembly comprising a steering input, a toothed driving member of tubular form which is rotatable about its axis, a toothed driven member whose teeth cooperate with those of the driving member for

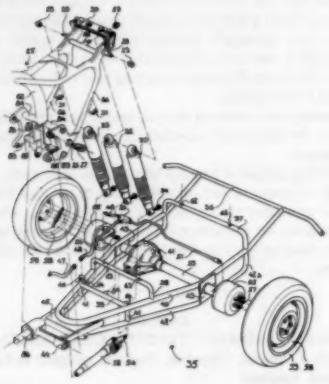
displacement of the driven member in response to rotation of the driving member to provide a steering output, fluid pressure-operated means associated with the driven member and adapted to provide power assistance to displacement of the driven member with rotation of the driving member, rotary valve means adapted to control distribution of said fluid to the power assistance means and comprising two concentric relatively rotatable valve members which are coaxial with the driving member and located on the side of said driving member remote from the steering input, one of the valve members coupled for rotation with the driving member, a torsionally rigid transmission member extending axially through the driving member and drivingly coupling the other of the valve members with the steering input, and spring means biasing the driving member and the steering input rotationally relative to each other and rotationally biasing the two valve members to a neutral condition.

4,449,602

REAR SUSPENSION AND STORAGE BOX FOR A THREE-WHEEL MOTORCYCLE

Fred M. Dittmann, Jr., Lake Zurich, Ill., assignor to Municipal Industries, Inc., Chicago, Ill.

Filed Jul. 9, 1982, Ser. No. 396,639
Int. Cl.³ B62K *5/06*
U.S. Cl. 180—215 **17 Claims**



1. A swing-arm type rear frame and suspension assembly for three-wheel motor vehicles comprising in operative combination:

(a) A generally U-shaped frame having its closed end disposed forward and open end disposed rearwardly;

(b) said closed end of said frame having means for retaining a transverse disposed swing arm pivot member;

(c) said swing-arm pivot member being adapted to be pivotally received in a main frame member of said vehicle;

(d) said open end of said frame terminating in a transverse bumper member;

(e) a rigid axle having means for retaining wheels at each end disposed medially of the ends of said frame and parallel to said bumper member and said swing-arm pivot member;

(f) said rigid axle having an off-center differential;

(g) said swing-arm pivot member being adapted to receive a drive shaft therethrough transverse to the pivotal axis of said swing arm, said drive shaft being aligned with said off-center differential;

(h) at least one resilient member connecting said rear frame to said main frame, said resilient member being oriented generally vertically and inclined forwardly from bottom to top;

(i) means for retaining said bottom end of said resilient member disposed on said frame intermediate said swing-arm pivot and said axle;

(j) said main frame having a seat for a rider disposed thereon;

(k) means for retaining said top end of at said resilient member disposed beneath said main frame seat member; and

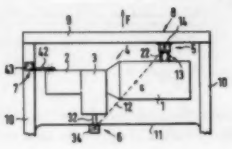
(l) means for securing a load carrying member disposed on rear frame intermediate the ends thereof.

4,449,603

SUSPENSION FOR A FRONT, ESPECIALLY A TRANSVERSELY-MOUNTED MOTOR VEHICLE POWER PLANT

Rolf Langwieder, Heimsheim; Rolf Rebmann, Kornwestheim; Erich Stotz, Kernen; Franz-Rudolf Wierschem, Kehrig, and Fred Trick, Münsingen, all of Fed. Rep. of Germany, assignors to Dr. Ing. h.c.F. Porsche AG, Fed. Rep. of Germany

Filed Apr. 28, 1982, Ser. No. 372,691
Claims priority, application Fed. Rep. of Germany, May 2, 1981, 3117378
Int. Cl.³ B60K *5/12*
U.S. Cl. 180—232 **22 Claims**



1. A suspension for a motor vehicle power plant arranged in an engine compartment defined by a frame structure on mounts located forwardly, rearwardly and laterally of the power plant, wherein one of said mounts comprises an energy-absorbing, high bending-strength longitudinal support that is connected by an elastic bearing to a transverse member of the frame structure forming an external end of the engine compartment, and is connected rigidly to the power plant; and in that at least one other of said mounts comprises a slide bearing means for permitting relative motion between the power plant and the frame structure.

4,449,604

FOUR-WHEEL DRIVE SYSTEM FOR AUTOMOTIVE VEHICLE

Kunihiko Suzuki, Yokohama, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed May 20, 1982, Ser. No. 380,292
Claims priority, application Japan, Jul. 15, 1981, 56-110434
Int. Cl.³ B60K *17/34*
U.S. Cl. 180—233 **17 Claims**

1. A four-wheel drive system for a vehicle having at least two pairs of road wheels consisting of a pair of front road wheels and a pair of rear road wheels, comprising:

a power unit having an output shaft rotatable about an axis in a lateral direction of the vehicle;

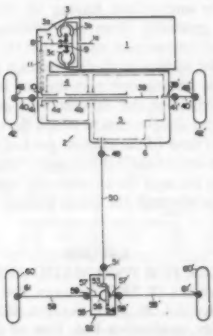
a power transmission gear unit including transmission input and output shafts having respective axes of rotation aligned with each other and substantially parallel with the axis of rotation of the output shaft of the power unit, and gears mounted on the transmission input and output shafts and arranged to be capable of selectively producing a plurality of ratios between the speeds of rotation of the transmission input and output shaft;

a first wheel drive gear unit comprising power splitting gear means operative to split driving power from said transmission output shaft into first and second driving power components, and a first differential gear assembly including gears arranged to split the first driving power compo-

nent into two output power components to be respectively transmitted to one of said two pairs of road wheels, the power splitting gear means and the first differential gear assembly being positioned substantially in alignment with said transmission input and output shafts in a lateral direction of the vehicle; and

a second wheel drive gear unit comprising a second differential gear assembly including gears arranged to split the second driving power component into two output power components to be respectively transmitted to the other of said two pairs of road wheels;

wherein said first wheel drive gear unit further comprises final reduction gear means positioned axially between said power splitting gear means and said first differential gear assembly, and power transfer gear means intervening between said power splitting gear means and said second wheel drive gear unit and operative to transmit therethrough said second driving power component to said second differential gear assembly and wherein said power splitting gear means, said first differential gear assembly and said final reduction gear means are axially aligned with said transmission input and output shafts,



said final reduction gear means comprising a final-reduction planetary gear assembly including an externally toothed sun gear rotatable about an axis substantially aligned with the axes of rotation of the transmission input and output shafts, an internally toothed ring gear coaxially encircling the sun gear and rotatable about the axis of rotation of the sun gear, at least two planet pinions each held in mesh with the sun gear and the ring gear and rotatable about an axis of rotation substantially parallel with the axis of rotation of the sun gear, and a pinion carrier interconnecting the planet pinions together and rotatable about the common axis of rotation of the sun gear and the ring gear, said planetary gear assembly having an input member constituted by one of said sun gear, said ring gear and said pinion carrier and an output member constituted by one of the remaining two of the sun gear, ring gear and pinion carrier, said transmission output shaft being held in driving engagement with said input member, said output member being held in driving connection to said first differential gear assembly.

4,449,605

DEVICE FOR PREVENTING THEFT OF MOTOR VEHICLES

William A. Read, 35631 Cabral Dr., Fremont, Calif. 94536

Filed Mar. 23, 1981, Ser. No. 246,853

Int. Cl.³ B60R *25/08*

U.S. Cl. 180—287 **14 Claims**

1. An anti-theft system for a motor vehicle having an electrical ignition system and a fuel line, comprising:

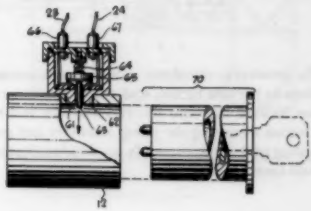
valve means attached to said fuel line for allowing or inhibiting the flow of fuel in the line in response to an electrical signal;

first circuit means connecting said valve means to the ignition switch of said vehicle, whereby the flow of fuel is turned on or off when the ignition switch is on or off, respectively;

electrical relay means connected to and actuated by said ignition switch; and

second circuit means connecting said relay means to the coil of said ignition system, such that said coil is either supplied voltage or grounded in response to the actuation or deactuation of said relay means;

wherein the ignition switch which is connected to and actuates said relay means includes a housing support holding a key



cylinder and switch contacts, such that said switch contacts are closed by rotating said key cylinder in said housing support, and such that said ignition switch is operated by a key inserted into said key cylinder and connects an electrical power source to the motor vehicle electrical system said anti-theft system further comprising:

switching means actuatable by the removal of the key cylinder from said system;

fuse means in the electrical circuit of the power source for said system; and

third circuit means connecting said switching means to said fuse means, such that said power source is disconnected from portions of said electrical system by said fuse means upon removal of said key cylinder and connection of its switch contacts.

4,449,606

VEHICLE FRAME ASSEMBLY

Floyd E. Buschbom, Long Lake, and Glen D. Hansen, Maple Plain, both of Minn., assignors to Veda, Inc., Long Lake, Minn.

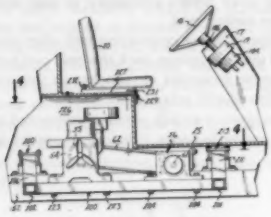
Division of Ser. No. 170,145, Jul. 18, 1980, Pat. No. 4,373,600. This application Sep. 29, 1982, Ser. No. 428,186

Int. Cl.³ B62D *61/06*; B60K *7/00*

U.S. Cl. 180—297 **8 Claims**

1. A vehicle comprising: a frame having first and second longitudinal horizontal side beams, said side beams being laterally spaced from each other, wheel means operably connected to the frame to support the frame for movement along a surface, fluid operated motor means drivably connected to the wheel means, a pump assembly for supplying fluid under pressure to the motor means whereby said motor means operates to drive said wheel means, engine means for operating said pump assembly, sub-frame means mounted on the frame, said sub-

frame comprising first and second transverse members, said transverse members being laterally spaced from each other, each transverse member having a generally horizontal mid-section located in the horizontal plane of the side beams and upwardly and outwardly end sections, a plurality of longitudinal members extended between and secured to the mid-sections



of the transverse members, mount means connecting said end sections to the side beams, said mount means including resilient means located between the end sections and the side beams, and means mounting the pump assembly and engine means for operating said pump assembly on said longitudinal members of the sub-frame means.

4,449,607

SOUNDPROOFING FOR A GAS PIPE, IN PARTICULAR FOR THE FAN JET OF A TURBOJET, AND EQUIPMENT FOR ITS FABRICATION

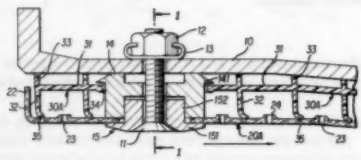
Alexandre Forestier, Vaux le Penil; Alain A. Pluquet, Melun; Roger A. Rosa, Morangis; Mansour Tabet, Melun, and Pierre M. Teysseyre, Juvisy sur Orge, all of France, assignors to S.N.E.C.M.A., Paris, France

Filed Jan. 26, 1982, Ser. No. 342,733

Claims priority, application France, Jan. 29, 1981, 81 01670

Int. Cl.³ E04B *1/82*

U.S. Cl. 181—213 **8 Claims**



1. A soundproof lining for the wall of a gas jet, said lining comprising:

a plurality of thin panels having overlapping ends and extending parallel to said wall;

means for fixing said panels directly to said wall and at a distance from said wall whereby said wall and panels define a space therebetween;

an intermediate ductile panel in said space, said ductile panel and said thin panels together defining a multiplicity of resonant acoustical cavities, wherein said intermediate panel comprises a thin polymer resin sheet having portions contacting said wall, said sheet including first ribs, the distal ends of said first ribs contacting said thin sheet to define said acoustical cavities; and

a plurality of acoustical vents for said cavities, said vents comprising perforations in said thin panels.

4,449,608

EXHAUST DEVICE FOR 2-CYCLE ENGINE

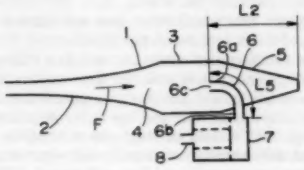
Makizo Hirata, and Yoshiteru Ueda, both of Kakogawa, Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Kobe, Japan

Filed Oct. 19, 1981, Ser. No. 312,217

Claims priority, application Japan, Oct. 20, 1980, 55-149970[U]

Int. Cl.³ F01N *7/08*

U.S. Cl. 181—228 **8 Claims**



1. An exhaust device for a 2-cycle engine comprising:

an exhaust pipe connected at its upstream end to an exhaust port of the engine and having its cross-sectional area increased gradually from the upstream end in going toward the downstream end so that the exhaust pipe has an expanded section in its downstream portion; and

an outlet pipe having one part thereof inserted in the expanded portion of the exhaust pipe and opening at its upstream end in a position in which the open end faces the direction of flow of the exhaust gas and at its downstream end at one side of the exhaust pipe, whereby the exhaust gas flowing through the exhaust pipe can be led out of the exhaust pipe through the outlet pipe.

4,449,609

MUFFLER FOR PNEUMATIC APPARATUS

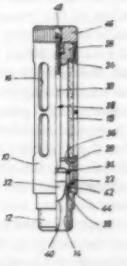
Kurt Stoll, Lenzhalde 72, 7300 Esslingen, Fed. Rep. of Germany

Filed Jul. 29, 1982, Ser. No. 403,168

Claims priority, application Fed. Rep. of Germany, Jul. 31, 1981, 3130292

Int. Cl.³ F01N *1/10, 1/18*

U.S. Cl. 181—230 **6 Claims**



1. In a muffler for use on pneumatic apparatus, said muffler having a hollow cylindrical housing with a connector means at one end and outlet openings, a hollow cylindrical damper cartridge made of a porous material and mounted inside said housing, wihin which hollow cartridge is arranged an axially adjustable choke member, said choke member having a choke head on an end thereof which faces said connector means, which together with a housing-fixed portion defines a variable choke gap therebetween, and a releasable knob member for axially fixedly orienting said damper cartridge in said housing, the improvement comprising wherein said outlet openings consist of elongate outlet slots which are provided in the peripheral wall of said housing and provides communication

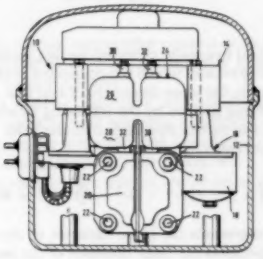
between the interior and exterior of said housing through said damper cartridge, wherein said choke head has a conically-shaped control section converging to a partial spherical end section, wherein said housing-fixed portion is a chamfered conically-shaped surface and wherein said choke head is provided with plural guide noses which slidingly engage a housing-fixed guide surface intermediate said housing-fixed portion and said damper cartridge to maintain a desired and thereby controlled spacing between the peripheral surface of said choke head and said guide surface as well as said housing-fixed portion.

4,449,610

MUFFLER FOR COMPRESSOR FOR REFRIGERATING APPARATUSES

Alfredo Bar, Pavia, Italy, assignor to Necchi Societa per Azioni, Pavia, Italy

Filed Feb. 17, 1982, Ser. No. 349,475
Claims priority, application Italy, Feb. 24, 1981, 42906 A/81
Int. Cl.³ F01N *1/08, 7/18;* F25D *3/02*
U.S. Cl. 181—243 **2 Claims**



1. A muffler for compressors which compressors consist of a hermetically sealed shell, a driving electric motor, a cylinder, and a head for said cylinder in which are located the intake and compression chambers of the refrigerant gas, said muffler consisting of two overlapping half-shells of identical structure, assembled by bringing their open walls together and rotating one half-shell 180° with respect to the other, each half-shell defining two extensions therefrom, one of said extensions in each half-shell defining a conduit therethrough communicating with the interior of said half-shell, said extension with conduit located on the upper half-shell conveying the refrigerant gas from the hermetically sealed shell into the muffler and the extension with conduit on the lower half-shell communicating the interior of said muffler with the intake chamber located in said head.

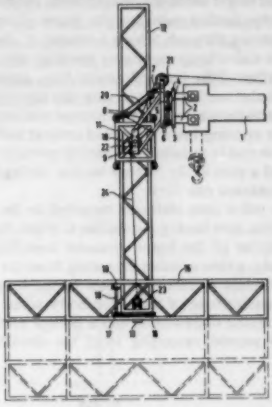
4,449,611

WORKING PLATFORM

Paul Frey-Wigger, Zeigerwald, CH-6247 Schötz, Switzerland

Division of Ser. No. 793,970, May 5, 1977, Pat. No. 4,274,793.
This application Nov. 19, 1980, Ser. No. 208,174
Claims priority, application Switzerland, May 5, 1976, 5611/76
Int. Cl.³ E04G *1/22, 1/36*
U.S. Cl. 182—63 **5 Claims**

1. A crane, comprising an extensible boom having an end portion, said boom being turnable about a vertical axis; a pivot bearing; means for detachably securing said pivot bearing to the end portion of said boom; a second bearing on which said pivot bearing is mounted; an elongated, substantially upright column on which said second bearing is reciprocably mounted, said column having an upper portion above and a lower portion below said second bearing; a platform; meanns for movably mounting said platform on one of said portions of said column; and means for moving said column and said platform



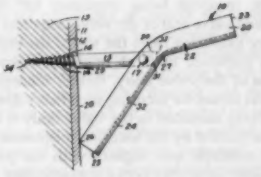
with respect to said second bearing, said moving means including a cable.

4,449,612

TREE STEP

Benny S. Southard, Rte. 1, Box 177, Summerfield, N.C. 27358

Filed Jun. 1, 1983, Ser. No. 499,833
Int. Cl.³ A63B *27/00, 29/04*
U.S. Cl. 182—92 **6 Claims**



1. A tree step comprising; an integral angle bracket having a foot-supporting portion and a projecting leg portion, said projecting leg portion having a tree-engaging end portion, a projecting supporting arm having opposite ends, one of said ends being secured to said angle bracket intermediate its ends, and the other said end being free, said other free end having a tree-engaging securing means thereon for supporting said integral angle bracket whereby upon retaining the projecting supporting arm in a horizontal position in a tree, said foot-supporting portion is substantially horizontal and said projecting leg portion forms a hypotenuse of a right triangle upon tree engagement by said tree-engaging end portion of said supporting arm.

4,449,613

OIL DRAIN VALVE WITH REMOTE CONTROL MEANS

Ralph J. Price, 7636 Upper Miamisburg Rd., Miamisburg, Ohio 45342

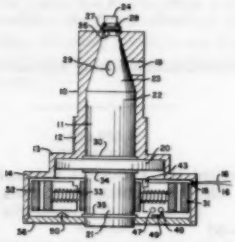
Filed Sep. 27, 1982, Ser. No. 424,437
Int. Cl.³ F01M *11/04*
U.S. Cl. 184—1.5 **5 Claims**

1. A remotely controlled oil drain valve assembly for an internal combustion engine crankcase comprising:

(a) a valve body having a tubular section with external threads suitable for connection to a threaded opening in the crankcase, stepped cylindrical bases of two different

diameters in juxtaposition below the threads, said lesser diameter base being in closest proximity to the threads and said larger diameter base forming the bottom of the valve body, further wherein the larger diameter base has an opening through which a source of electricity can pass, the valve body having an opening starting at the bottom surface of the larger diameter base, extending through the tubular section and piercing the top portion thereof, further wherein a valve seat formed within the valve body by the opening has a truncated conical surface with the narrow end in proximity of the top portion of the valve body and a port in the tubular section through which oil in the crankcase can flow;

(b) a valve core slideably mounted in the valve body, said valve core having a shoulder of a size for mating with the interior of the lesser diameter base found on the valve body, a tube member extending from the shoulder a length sufficient to extend at least to the bottom of the larger diameter base of the valve body when the valve core is mounted therewithin, and a hollow member with a conical section extending from the shoulder with the end



farthest removed being truncated for reception in the truncated valve seat of the valve body and having a protuberance extending from the top of the truncated end of a length sufficient to fit through the opening on the top portion of the valve body, further wherein the protuberance has means for securing such that when the valve core is slideably mounted in the valve body it is secured from vertical motion by the securing means and further having a port rotatable into registry with the port in the valve body, said valve core port communicating with a passageway in the valve core which extends through the valve core to the bottom of the tube member;

(c) means within the larger diameter base for effecting rotary motion to the valve core in response to an electric signal from a remote source so as to rotate said core valve to an open position such that the valve core port is in alignment with the valve body port or to a close position such that the valve core port and valve body port are not in alignment; and

(d) a dust cap of a size for securely fitting over the opening found in the bottom of valve body and having a hole into which the tube member of the valve core extends.

4,449,614

LIFT DEVICE

Minoru Matsuda, Hamura, Japan, assignor to Nissan Motor Company, Limited, Japan

Filed Nov. 30, 1981, Ser. No. 326,117
Claims priority, application Japan, Nov. 28, 1980, 55-167790
Int. Cl.³ B66B *9/20*
U.S. Cl. 187—9 R **3 Claims**

1. A lift device comprising:

a base member;

a pair of outer masts vertically secured on the base member parallel to each other;

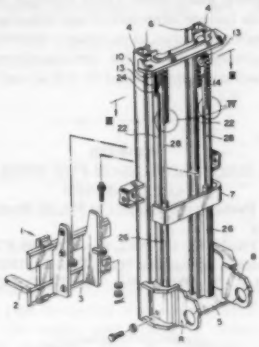
a pair of inner masts slidably mounted in said outer masts;

a load carrier slidably mounted on said pair of inner masts;

a pair of chains, one end of each of which is connected to said load carrier;

a pair of gears for engaging with said chains;

a pair of first hydraulic cylinders having first cylinder rods connected at their free ends to brackets for said gears;



a pair of second hydraulic cylinders having second cylinder rods, the free ends of which are connected to the free ends of said chains, the inner diameters of said first and second cylinders being defined by the following formula in order to actuate said second hydraulic cylinder prior to said first hydraulic cylinder:

$$\pi/4 \times D_1^2 \times p < 2\{\pi/4 \times (D_2^2 - d_2^2) \times p\} + W_M + R_W$$

wherein D_1 represents the inner diameter of the first cylinder; D_2 represents the inner diameter of the second cylinder; d_2 represents the outer diameter of the second cylinder rod; W_M represents the weight of the inner mast; R_W represents the friction resistance between the load carrier and the inner mast; and p represents the pressure force applied to the cylinders;

and a cylinder actuating means for actuating said first cylinders and second cylinders, said cylinder actuating means containing a fluid pressure feeding source, a main fluid passage connected to said fluid pressure feeding source, a first fluid passage connected between said main fluid passage and a bottom of said first cylinder, and a second fluid passage connected between said main fluid passage and a top of second cylinder;

whereby said second cylinder rod can be moved downward before said first cylinder rod is moved upward.

4,449,615

HYDRAULIC RAM SAFETY DEVICE WITH CIRCULAR BRAKE

Robert W. Beath, Burbank, and John R. McDonald, San Francisco, both of Calif., assignors to McDonald Elevator, San Francisco, Calif.

Filed Aug. 4, 1981, Ser. No. 290,018
Int. Cl.³ B60S *13/00*; F15B *15/26*
U.S. Cl. 188—67 **7 Claims**

1. A hydraulic ram safety brake of the type including braking members adapted to engage the ram or piston to stop movement of the piston when the braking members are released in the direction of piston travel in a failure condition, comprising:

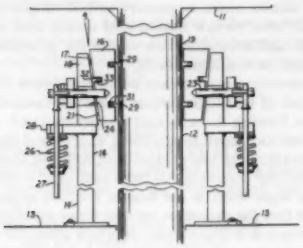
a housing surrounding a portion of the piston and fixedly mounted with respect to fixed structure adjacent to the piston, the housing having a tapered inner surface generally in the shape of a truncated cone;

a plurality of brake sections positioned in a circular array between the housing and the piston, the brake sections

together forming an outer surface in the general shape of a truncated cone, generally matching the inner surface of the housing and being engaged against it;

at least one recess in a face of each brake section, the recesses being aligned in a circular array, and a holding wire in a generally circular configuration extending through each recess to hold the brake sections in registry;

said brake sections being spaced apart when the safety brake



is in the normal, inoperative position with the brake sections spaced away from the engaged position and outwardly from the piston;

means for holding the brake sections in the inoperative pistion under normal operating conditions;

means urging the brake sections, together, toward the position of engagement with the piston, and

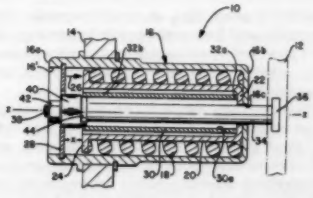
means for releasing the holding means under a failure condition.

4,449,616

NON-REVERSIBLE BRAKE ADJUSTER

Lester W. Musser, Jr., Barberton, and Lee A. Germain, Tallmadge, both of Ohio, assignors to Goodyear Aerospace Corporation, Akron, Ohio

Filed Dec. 3, 1979, Ser. No. 99,353
Int. Cl.³ F16D *55/02*
U.S. Cl. 188—71.8 **8 Claims**



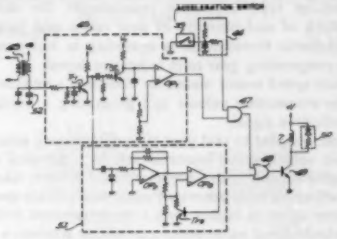
1. An improvement in disc brake assemblies including automatic adjusting apparatus to compensate for brake wear, said adjusting apparatus including pin means interconnecting a brake pressure plate at one end and a metal swaging device at the opposite end and oriented axially within a deformable tube such as to radially deform the tube to the shape of the swaging device as the device moves into the bore of the tube in response to brake wear, the improvement comprising means cooperating with said pin and positioned relative to the swaging device within the tube to move easily with the pin and swaging device in the swaging direction but which prevents movement in the reverse direction by reason of the deformed shape of the tube.

4,449,617

ELECTRO-MAGNETIC CLUTCH CONTROL SYSTEM FOR AUTOMOBILES

Ryuzo Sakakiyama, and Toshio Takano, both of Tokyo, Japan, assignors to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 22, 1981, Ser. No. 276,325
Claims priority, application Japan, Jul. 16, 1980, 55-97360
Int. Cl.³ F16D *43/22, 27/00*
U.S. Cl. 192—0.033 **18 Claims**



1. A system for controlling an electro-magnetic clutch for an engine powered car, which has an accelerator pedal, an ignition device for an engine of said car, and a magnetizing coil for coupling said electro-magnetic clutch, comprising

an acceleration detecting circuit responsive to the depression of said accelerator pedal for producing an output signal,

an engine speed detecting circuit adapted to produce an output signal when the engine speed exceeds a predetermined speed, said output signal being retained until said engine speed falls below a speed different from said predetermined speed,

current means for producing an output for increasing the current passing through said magnetizing coil,

gate means responsive to outputs of said acceleration detecting circuit and said means for producing a first output for increasing the current passing through said magnetizing coil and further responsive to said output of said engine speed detecting circuit for producing a second output for a rated current of said magnetizing coil, and

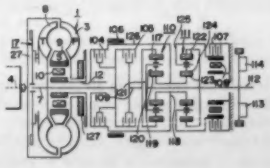
switch means provided in the circuit of said magnetizing coil and responsive to outputs of said gate means for allowing the current to pass through said magnetizing coil.

4,449,618

LOCK-UP CONTROL SYSTEM FOR LOCK-UP TYPE AUTOMATIC TRANSMISSION

Masaaki Suga, Yokohama; Yoshiro Morimoto, and Hideo Hamada, both of Yokosuka, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Mar. 26, 1981, Ser. No. 247,906
Claims priority, application Japan, Mar. 27, 1980, 55-38151; Sep. 26, 1980, 55-133007
Int. Cl.³ B60K *41/22*
U.S. Cl. 192—3.31 **13 Claims**



1. A lock-up type automatic transmission for use with an

engine in an automotive vehicle, said lock-up type automatic transmission being shiftable between a plurality of gear ratios including a first gear ratio, a second gear ratio and a third gear ratio and comprising:

a torque converter having a pump impeller adapted to be driven by said engine and a turbine runner;

a lock-up clutch having a clutch piston drivingly connected to said turbine runner, said lock-up clutch being selectively engageable with said pump impeller;

gear ratio determining means operatively connected to said lock-up type automatic transmission for determining which of said plurality of gear ratios said lock-up type automatic transmission is operating in and generating a corresponding gear ratio indicative signal;

vehicle speed sensor means for detecting a vehicle speed of the automotive vehicle and generating a vehicle speed indicative signal;

means, coupled to said gear ratio determining means and to said vehicle speed sensor means, for generating a lock-up signal according to a predetermined pattern, wherein said lock-up signal is generated when said vehicle speed indicative signal is higher than a predetermined first lock-up vehicle speed value under a condition wherein a first gear ratio indicative signal is present or when said vehicle speed indicative signal is higher than a predetermined second lock-up vehicle speed value under a condition wherein a second gear ratio indicative signal is present or when said vehicle speed indicative signal is higher than a predetermined third lock-up vehicle speed value under a condition wherein a third gear ratio indicative signal is present;

control means, coupled to said generating means, for engaging said lock-up clutch in response to said lock-up signal;

temperature sensor means operatively connected to said engine for detecting a temperature of said engine and for generating a low temperature signal when the temperature of said engine is lower than a predetermined temperature value;

means responsive to said low temperature signal for preventing said lock-up signal from being coupled to said control means in said predetermined pattern.

4,449,619

SYSTEM FOR CONTROLLING AN ELECTROMAGNETIC CLUTCH FOR AUTOMOBILES

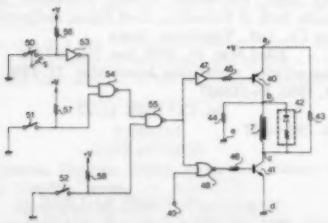
Ryuzo Sakakiyama, Tokyo, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 25, 1981, Ser. No. 305,420

Claims priority, application Japan, Sep. 30, 1980, 55-137221

Int. Cl.³ F16D *27/16*; B60K *41/28*

U.S. Cl. 192—0.052 **13 Claims**



1. In a system for controlling an electro-magnetic clutch of an internal combustion engine mounted on a vehicle which has an accelerator pedal, a drive member secured to a crankshaft of said internal combustion engine, a driven member adjacent said drive member, a transmission secured to said driven member and having multi-stage change gears and a shift lever therefor, a magnetizing coil provided in one of said members, and an electric circuit means including said magnetizing coil which is capable of passing excitation current through said magnetizing coil in a normal direction, the improvement comprising

shift lever switch means for producing an output signal having one logic level during a shifting operation of the shift lever of said transmission,

a neutral switch means for producing an output signal having one logic level in a neutral position of the shift lever,

a clutch hold switch means for producing an output signal having one logic level when said accelerator pedal is depressed,

logic circuit means responsive to said output signals of said shift lever switch means, said clutch hold switch means and said neutral switch means for providing an output signal having logic levels,

said electric circuit means being responsive to said output signal of said logic circuit means for controlling the current flowing through said magnetizing coil, and

said electric circuit means being so arranged that the current flows through said magnetizing coil with inverted polarity when the output signal from said logic circuit means has one logic level in the neutral position of said shift lever and that the excitation current flows through said magnetizing coil in said normal direction when the output signal of said logic circuit means has another logic level when said accelerator pedal is depressed in the neutral position of said shift lever for causing a double clutch operation.

4,449,620

ELECTROMAGNETIC CLUTCH CONTROL SYSTEM FOR VEHICLES

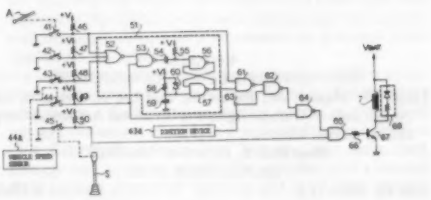
Ryuzo Sakakiyama, Tokyo, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 23, 1981, Ser. No. 323,800

Claims priority, application Japan, Nov. 28, 1980, 55-168414

Int. Cl.³ B60K *41/28*

U.S. Cl. 192—0.052 **3 Claims**



1. A system for controlling an electromagnetic clutch having a magnetizing coil for coupling said electromagnetic clutch of a vehicle powered by an engine having a transmission with a multi-stage change gears, said magnetizing coil being connected in a circuit to voltage, comprising

acceleration detecting means for producing an output signal upon an acceleration action condition of said vehicle,

vehicle speed detecting means for producing an output signal when vehicle speed exceeds a predetermined speed,

vehicle travelling detecting means for producing an output signal when said vehicle is driven at a high speed transmission ratio of said transmission,

a trouble detecting circuit comprising, first gate means responsive to said acceleration detecting means, said vehicle speed detecting means and said vehicle travelling detecting means, and a flip-flop operatively connected to said gate means so as to provide a trouble output signal when said output signal of said vehicle speed detecting means is not applied to said gate means when said output signals of said accelerating detecting means and of vehicle travelling detecting means occur,

second gate means hving gates and being responsive to said trouble output signal, said vehicle speed detecting means, and said acceleration detecting means, said second gate

means for producing a first output signal dependent on said trouble output signal, and respectively, for producing a second output signal dependent on said output signal of said vehicle speed detecting means,

switch means provided in the circuit of said magnetizing coil and responsive to the respective said output signals of said second gate means for allowing the current to pass through said magnetizing coil depending on the condition of said switch means,

means for applying pulses to an input of one of the gates in said second gate means, and

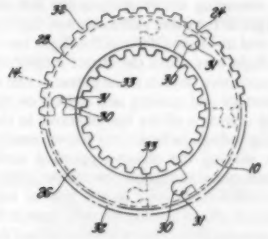
said second gate means for producing pulses as said first output signal in response to said trouble output signal, so that said magnetizing coil is intermittently energized so as to partially engage the clutch.

4,449,621

SEGMENTED CLUTCH PLATES

Erwin F'Geppert, Oakland, Mich., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 12, 1981, Ser. No. 292,308
Int. Cl.³ F16D *13/52, 13/68*
U.S. Cl. 192—70.13 **1 Claim**



1. A rotary disk clutch assembly comprising a first set of annular clutch plates equipped with serrated outer edges to engage splines on a rotary casing, and a second set of annular clutch plates equipped with serrated inner edges to engage splines on a rotary hub concentric with the casing, individual plates in the second set to form frictional drive connections between the casing and hub;

each clutch plate in said first set of clutch plates being formed of at least three plate segments of identical size and configuration; each clutch plate in said second set of clutch plates being formed of at least three plate segments of identical size and configuration;

the number of plate segments in individual plates of the first set being different than the number of plate segments in the individual plates of the second set, whereby the facing surfaces of any two adjacent clutch plates can have a maximum of only two segment joints in axial alignment with one another at any one instant;

each of said clutch plate segments in the first and second sets of plates having a key-shaped tab at one end and a key-hole-shaped notch of the same size and shape at its other end, said tabs and notches extending entirely through each associated plate segment for the full plate segment thickness, the arrangement being such that the tab of one segment locks into the notch of an adjacent segment to form a rigid unitary clutch plate wherein the segments are precluded from separation in axial, radial or circumferential directions;

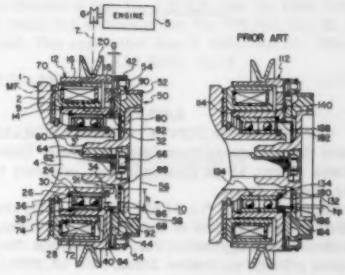
the clutch plates in said first set of plates having their faces directly exposed to the faces of adjacent plates in said second set of plates whereby the application of an axial operating force on the disk clutch assembly causes adjacent clutch plate faces to have frictional engagement with one another.

4,449,622

COVER MEMBER FOR A MAGNETICALLY OPERATED CLUTCH

Reijiro Okano, Chiryu, and Kiyoshi Usami, Oobu, both of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed May 20, 1982, Ser. No. 380,251
Claims priority, application Japan, May 21, 1981, 56-76849
Int. Cl.³ F16D *27/06*
U.S. Cl. 192—84 C **11 Claims**



1. An electromagnetic clutch for respectively connecting and disconnecting a drive source to and from a driven device having a fixed hollow cylindrical projection and a rotatable shaft extending within said hollow projection in concentric relation thereto, said electromagnetic clutch comprising:

a rotatable body made of magnetizable material and disposed around said hollow cylindrical projection of said driven device in concentric relation thereto, said rotatable body being drivingly connectable to said drive source for rotation around an axis of said shaft and having an inner peripheral surface faced to said cylindrical projection and opposite axial end faces;

a bearing disposed between an outer peripheral surface of said cylindrical projection and the inner peripheral surface of said rotatable body for rotatably supporting said rotatable body on said cylindrical projection;

an annular armature made of magnetizable material and connectable to said shaft of said driven device for rotation therewith, said armature being faced to one of the opposite axial end faces of said rotatable body, but normally spaced therefrom by a suitable gap, said armature being movable between an engaging position where said armature is attracted and abuts against said one axial end face of said rotatable body to allow the rotation of said rotatable body by said drive source to be transmitted to said shaft and a disengaging position where said armature is spaced from said one axial end face of said rotatable body by said suitable gap to prevent the rotation of said rotatable body from being transmitted to said shaft;

an exciting solenoid associated with said armature for moving the same between said engaging and disengaging position in response to energization and deenergization of said solenoid; and

a cylindrical cover member made of thermoplastic material and fixedly mounted, independently of said bearing, on a portion of the inner peripheral surface of said rotatable body between said one axial end face thereof and said bearing, said cover member having a cylindrical peripheral wall having an axial length thereof extending so as to cover said gap between said one axial end face of said rotatable body and said annular armature and also cover an inner peripheral surface of said annular armature, said cylindrical cover further having an annular end wall

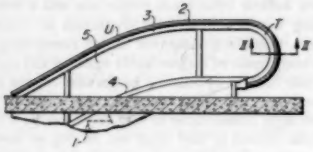
radially inwardly extending from one axial end of said peripheral wall of said cylindrical cover member remote from said bearing, to a location where an opening defined by an inner peripheral edge of said annular end wall is located adjacent to a free end of said hollow cylindrical projection of said driven device, said peripheral wall and said annular end wall of said cover member cooperating with each other to define a reservoir space having a relatively large volume for oil leaking out of said driven device and grease flowing from said bearing.

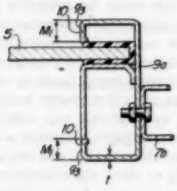
4,449,623

PASSENGER CONVEYOR BALUSTRADE

Chuichi Saito; Katsuya Teranishi; Katsuyoshi Baba, and Yoshihiro Osumi, all of Katsuta, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 84,593, Oct. 15, 1979, abandoned, which is a continuation of Ser. No. 848,327, Nov. 3, 1977, abandoned. This application Feb. 10, 1983, Ser. No. 465,619
Claims priority, application Japan, Nov. 12, 1976, 51-135399
Int. Cl.³ B66B *9/14*
U.S. Cl. 198—335 1 Claim





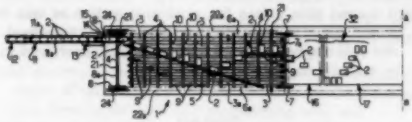
1. In a balustrade for use with passenger conveyors including a handrail guide for guiding a handrail adapted to be moved in synchronism with an endless series of steps, a first stainless steel deck member and a second stainless steel deck member connected to the first deck member, each deck member having a U-shaped cross-section with an opening thereof facing an opposite side of the handrail, each of said first and second deck members being bent to have arcuate-shaped sections at landings of the conveyors, the improvement comprising deformation preventing strips for preventing creation of wrinkles and deformations in the stainless steel in an area of the arcuate-shaped sections, the deformation preventing strips are provided adjacent the opening about the arcuate-shaped sections of the deck members and bent inwardly, wherein each of said deformation preventing strips is formed such that it projects from the deck member for a distance which is over 1.5 times the thickness of the deck member.

4,449,624

DEVICE FOR CONVEYING AND REDISTRIBUTING OBJECTS

Didier Lemaire, Cherisy-Vernouillet, and Gérard Lebret, Saint Lubin des Joncherets, both of France, assignors to E. P. Remy et Cie, Dreux, France

Filed Nov. 16, 1981, Ser. No. 321,543
Claims priority, application France, Dec. 19, 1980, 80 27117
Int. Cl.³ B65G *47/24*
U.S. Cl. 198—412 7 Claims



1. Conveyor apparatus for transporting objects in a predetermined line of travel and for selectively distributing said objects transversely with respect to the line of travel, the apparatus including an object-supporting surface having an entrance end, an exit end, and two side margins extending parallel to the line of travel, an endless flight bar conveyor extending parallel to the line of travel, the flight bar conveyor having a plurality of spaced bars extending transversely to the line of travel from one side margin to the other side margin of the object-supporting surface, and means for driving the flight bar conveyor for moving the flight bars above the object-supporting surface for contacting successive objects at the entrance end of the object-supporting surface and moving said objects on the supporting surface in the direction of the line of travel to the exit end of the supporting surface, wherein the improvement comprises:

means for moving the object-supporting surface continuously from one side margin toward the other side margin in a direction transverse to the line of travel, thereby causing each object to slide laterally against the respective flight bar as the flight bar moves said object forward in the line of travel and

an elongated stop member fixed to each flight bar at a predetermined lateral position between the side margins of the supporting surface, the stop member extending forwardly from the flight bar substantially parallel to the line of travel and having a length sufficient to stop further lateral movement of the object being conveyed.

4,449,625

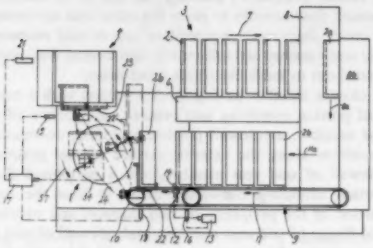
APPARATUS FOR TRANSPORTING TRAYS FOR CIGARETTES OR THE LIKE

Karl H. Grieben, Schwarzenbek, and Günter Menge, Hamburg, both of Fed. Rep. of Germany, assignors to Hauni-Werke Körber & Co. KG., Hamburg, Fed. Rep. of Germany

Filed Sep. 21, 1981, Ser. No. 304,266
Claims priority, application Fed. Rep. of Germany, Oct. 1, 1980, 3037065
Int. Cl.³ B65G *37/00*
U.S. Cl. 198—472 33 Claims

1. Apparatus for transporting trays or analogous containers for cigarettes, filter rod sections or other rod-shaped articles from a first station to a second station, comprising first drive means having a portion arranged to orbit along a first circular path, said first drive means comprising a first lever rotatable about a fixed axis and said portion of said first drive means being remote from said fixed axis and defining a second axis; means for rotating said first lever about said fixed axis at a first angular velocity; second drive means mounted on said portion of said first drive means and having a portion arranged to orbit along a second circular path superimposed upon said first circular path, said second drive means comprising a second lever rotatable about said second axis and said portion of said second drive means being remote from said second axis; means for rotating said second lever about said second axis at a sec-

ond angular velocity which is twice said first angular velocity; and conveyor means for containers, said conveyor means being



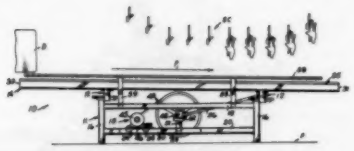
rotatably mounted in said portion of said second drive means and said first and second drive means defining an elliptical path for said conveyor means.

4,449,626

POULTRY CONVEYOR

Ned T. Dodd, Rte. 2, Lula, Ga. 30554

Filed Sep. 24, 1981, Ser. No. 305,097
Int. Cl.³ B65G *27/08*
U.S. Cl. 198—765 **7 Claims**



1. A poultry conveyor for conveying birds in a poultry processing plant comprising:

a support frame;

an elongated conveying trough having an infeed end and an opposed downstream end and defining a conveying surface thereon extending along the length thereof and retaining means to maintain the birds on the conveying surface;

mounting means for movably mounting said conveying trough on said support frame for movement of said trough with respect to said support frame along a horizontal rectilinear path extending longitudinally of said conveyor trough, said mounting means including a plurality of mounting assemblies, each of said mounting assemblies including an elongate horizontally oriented inverted V-shaped angle member fixedly mounted on said support frame and extending longitudinally thereof, said angle member defining an elongate guide surface thereon; a guide roller rotatably mounted on said conveyor trough about a rotational axis extending transversely of and fixed with respect to said conveyor trough, said roller defining a peripheral V-shaped groove therearound adapted to rotationally engage said angle member to movably support said conveyor trough thereon; a pair of keeper plates mounted on said conveyor trough and located on opposite sides of said angle member when said roller is supported thereon; and at least one keeper pin mounted between said keeper plates and extending under said angle member to limit the vertical movement of said conveyor trough and maintain said groove in said roller in conforming contact with said angle member, said mounting assemblies mounting said conveyor trough so that said conveying surface angles with respect to the horizontal with said downstream end lower than said infeed end; and

drive means for reciprocating said trough along said rectilinear path to cause birds deposited on said conveying surface on said conveying trough to be moved along said conveying surface from said infeed end of said trough toward said downstream end of said trough.

4,449,627

ANTI-BACKBEND BELTS

Ralph W. Kell, Lincoln, Nebr., assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Continuation of Ser. No. 191,230, Sep. 26, 1980, abandoned, which is a division of Ser. No. 115,829, Jan. 28, 1980, Pat. No. 4,267,921, which is a division of Ser. No. 944,485, Sep. 21, 1978, abandoned. This application Jun. 9, 1982, Ser. No. 386,542
Int. Cl.³ B65G *15/34*
U.S. Cl. 198—847 **3 Claims**

1. An anti-backbend, endless flexible belt means for operation between a plurality of pulleys, including at least one flexible belt having an elastomeric body and opposite inside and outside surfaces, the inside surface of any belt of said belt means being directed toward the pulley axis when the belt means are in use, said one belt including a molded body of generally rectangular cross section; an abrasion resistant elastomer-impregnated fabric inside surface layer; a layer of cushion elastomer having a plurality of longitudinally extending high tensile modulus cords embedded therein next to the abrasion resistant layer and positioned close to the inside surface of the belt; and an outside layer of substantially incompressible elastomer next to the cushion layer and having a plurality of continuous, low tensile, high compression modulus monofilaments embedded longitudinally therein nearer to the outside surface than the inside surface of said one belt and spaced outwardly from the tensile cords, the monofilaments tending to stretch when passing around pulleys but resisting compression when straightened between the pulleys such that the cooperative effect of the spaced-apart high compression modulus monofilaments and the high tensile modulus cords provides an anti-backbend characteristic to said one belt.

4,449,628

MAGNETIC DISK STORAGE CASE

Robert A. Egly, 1630 Marguerite Dr., Corona del Mar, Calif. 92625, and Patrick Sullivan, 1752 Brookshire Ave., Tustin, Calif. 92680

Continuation-in-part of Ser. No. 226,621, Jan. 21, 1981, Pat. No. 4,369,879. This application Sep. 13, 1982, Ser. No. 417,691
Int. Cl.³ B65D *85/57, 1/24*
U.S. Cl. 206—45.18 **14 Claims**

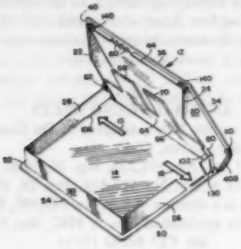
1. A container for magnetic storage material such as disks, magnetic cards and the like comprising:

a clamshell-like opening and closing container having a bottom portion which generally provides a base and a receptacle for a top portion of said clamshell container which has been hinged thereto and which has a ledge within said top portion of said container for receipt of magnetic memory storage members between the ledge and the inner surface of said container;

means for resiliently hinging said bottom and top member formed from a continuous hinge member between said top and bottom member; and,

means for holding said top member open in a resting mode on said bottom member for exposure and access of magnetic storage members resting on said ledge between said top member and said ledge comprising an opening and a pin for

seating in said opening on either the top or bottom member for holding them in the open position wherein the pin is such that it interfaces between the walls of said top and bottom



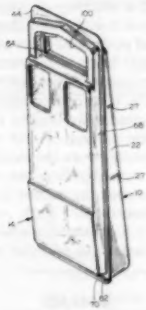
member and specifically extends into the margin between said top and bottom member and can be biased for movement into or out of the opening by virtue of at least one of said walls flexing in order to bias said pin.

4,449,629

DISPLAY AND STORAGE CONTAINER FOR MULTIPLE TOOL PARTS AND THE LIKE

Paul B. Barrieau, Farmington, Conn., assignor to The Stanley Works, New Britain, Conn.

Filed Mar. 29, 1983, Ser. No. 480,141
Int. Cl.³ B65D *1/24, 85/62;* **A45C** *11/26*
U.S. Cl. 206—45.19 **18 Claims**



1. A unitized display and storage container for multiple items including:

A. a base member of synthetic resin having a body section of generally U-shaped cross section defined by a bottom wall and sidewall providing an upwardly opening cavity therebetween, and a peripheral flange extending outwardly from the upper edge of said sidewall and about at least the major portion of the periphery thereof;

B. a seat member of synthetic resin material having a body section with a peripheral flange extending outwardly and about at least the major portion of the periphery thereof and overlying said flange of said base member, said seat member also having an upstanding pedestal portion within said peripheral flange and comprising a peripheral sidewall extending upwardly from said peripheral flange and a central wall portion inwardly of said sidewall defining a multiplicity of upwardly opening recesses, the central wall portion at the bottom of at least one recess extending below the plane of the peripheral flanges of said seat and base members and into the cavity defined by said base member, another of said recesses being divided by ribs spaced along it length into a multiplicity of upwardly opening elongated compartments extending between its sides, the central wall defining the base of said compartments being lower adjacent said sides than in the center thereof, whereby elongated elements stored therein may be readily gripped by pressing one end of the associated element downwardly to pivot the other end upwardly;

C. a cover sheet overlying another one of said recesses of said seat member and adhered to said central wall portion thereabout to mask the recess thereunder;

D. a closure member having a body section with a central wall portion overlying said central wall portion of said seat member, a sidewall portion extending downwardly therefrom along the exterior surface of said peripheral sidewall of said seat member, and a peripheral flange portion extending outwardly about at least the major portion of the periphery of said sidewall and overlying said flange of said seat member, said sidewall of said closure member frictionally engaging said sidewall of said seat member in the closed position thereof; and

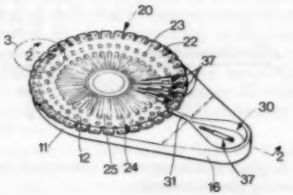
E. a band of transparent synthetic resin material tightly encircling said base member and closure member.

4,449,630

PACKAGE FOR DENTAL TOOLS

Stuart J. Filhol, Castlefreke, County Cork, Ireland

Filed Jan. 18, 1982, Ser. No. 340,479
Int. Cl.³ B65D *85/24, 85/20*
U.S. Cl. 206—369 **10 Claims**



1. A package for articles comprising a base member, a rotary member carried on the base member for rotation relative to the base member, a circular space defined between the base member and the rotary member, and compartments in said space extending radially of the axis of rotation of the rotary member, the radial compartments being defined by radially directed portions of the rotary member and being arranged to contain the articles, and the base member defining an outlet chute leading to a receiving pocket and communicating with said space whereby each of the radial compartments is able to be aligned in registration with the chute upon rotation of the rotary member to enable an article in a compartment in registration with the chute to be passed from the compartment into the receiving pocket.

4,449,631

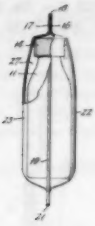
TAMPER PROOF PACKAGING

Nat Levenberg, and Alvin Levenberg, both of 1345 Halsey St., Brooklyn, N.Y. 11237

Filed Mar. 7, 1983, Ser. No. 473,126
Int. Cl.³ B65D *85/56, 81/20, 33/34*
U.S. Cl. 206—459 **3 Claims**

3. As a new article of manufacture, a tamperproof package comprising: an enclosed article; a pair of flexible planar laminae, the peripheral area of which are heat-sealed to enclose said article, the heat-sealed areas having a printed pattern on

the exposed surfaces thereof; said laiminae being inflated inwardly of said heat-sealed areas by air and trapped during a



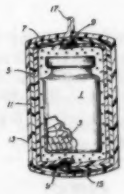
sealing operation, and further inflated by a subsequent heat-shrinking operation.

4,449,632

TAMPER-PROOF PACKAGE AND METHOD

Frank Marusiak, Jr., 73 Ann St., Newark, N.J. 07105

Filed Dec. 15, 1982, Ser. No. 449,846
Int. Cl.³ B65D *85/56, 81/20, 83/04;* B65B *25/06*
U.S. Cl. 206—540 **17 Claims**



1. A package for an article comprising:
a first container into which the article is placed;
a substantially gas impermeable, flexible second container completely enclosing said first container, a void existing between said first and second containers, said void being pressurized with a gas; and
a first elastic layer surrounding said second container, said elastic layer tightly stretched about said second container.

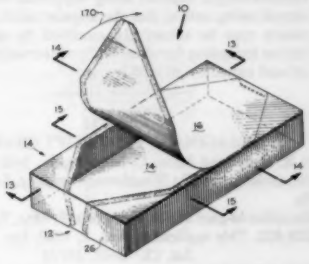
4,449,633

OVENABLE PAPERBOARD CARTON

Harold D. Johnson, Bourbonnais, Ill.; Earle C. Sherman, West Monroe, La., and Leonard M. Cooper, Bradley, Ill., assignors to Manville Service Corporation, Denver, Colo.

Continuation of Ser. No. 963,871, Nov. 27, 1978, abandoned. This application Dec. 17, 1979, Ser. No. 104,626
Int. Cl.³ B65D *5/54, 5/68*
U.S. Cl. 206—612 **5 Claims**

1. An improved ovenable paperboard carton for use in a microwave and conventional oven, comprising:
(a) a generally rectangular shaped bottom tray comprising a central bottom panel and having hingedly attached thereto a plurality of bottom side panels;
(1) each adjacent pair of bottom side panels having hingedly attached thereto a pair of gusset panels, hingedly attached to each other and to the bottom side panels;
(b) a generally rectangular shaped upper lid for positioning over the bottom tray, comprising a central top panel and having at least three top side panels hingedly attached thereto;
(1) a pair of three directional reverse cuts, forming a tear-off portion, positioned on the upper lid and initiating at an edge of one top side panel and running in a first direction to a central portion upper edge of an adjacent side panel, thereafter running in a second direction on the top panel in juxtaposition to the adjacent side panel edge and thereafter running in a third direction and terminating in the central portion of the top side panel opposite to the top side panel where the reverse cuts initiated, the reverse cuts so positioned and running in the first and third directions forming triangular shaped corner reinforcements on the upper lid located at each corner of the lid, the reverse cuts running in the second direction also forming an elongated section in the second direction on two opposite sides of the carton, the two elongated sections being substantially parallel to each other and connecting the triangular shaped corner reinforcements; and
(2) adhesive means, associated with the upper lid and the bottom tray for fixedly adhering the top side panels of



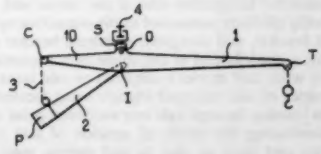
the upper lid to at least three bottom side panels of the bottom tray whenever the upper lid has been positioned over the bottom tray, the adhesively glued upper lid and bottom tray forming rigid double thickness side panels on at least three of the sides of the paperboard carton, the pair of three directional reverse cuts forming the triangular shaped corner reinforcements along with the substantially parallel elongated sections in combination with the glued upper lid and bottom tray serving to improve the twisting tendencies of the carton whenever the tear-off portion on the upper lid is removed leaving the triangular shaped corner reinforcements and the substantially parallel elongated sections intact as a unit and whenever the carton is removed from an oven thereby improving torsional stability of the package when used.

4,449,634

HOISTING ASSEMBLY WITH A BOOM AND A COUNTERWEIGHT HAVING ADJUSTABLE RESPECTIVE POSITIONS

Lilian Buzzichelli, and Kléber Roy, both of Toulouse, France, assignors to Enterprises Buzzichelli, L'Union, France

Filed Jul. 6, 1981, Ser. No. 280,315
Claims priority, application France, Jul. 4, 1980, 80 14991
Int. Cl.³ B66C *23/72*
U.S. Cl. 212—196 **3 Claims**



1. A hoisting assembly for hoisting loads, comprising:
a boom for suspending loads having a main portion having a

longitudinal axis and a load suspending end; said load suspending end having means for suspending a load;

a counterweight;

a counterweight support extending in a generally opposite direction from said boom while in the same vertical plane as said boom and supporting said counterweight; and

adjustable connecting means interconnecting said boom and said counterweight, said connecting means being adjustable independently of said means for suspending a load, said boom and said counterweight support being idly mounted on a main support so as to constitute with said connecting means a pendular assembly adapted to freely swing about a horizontal swing axis, said boom including an extension having substantially the same longitudinal axis as the main portion of said boom, said extension being located on the same side as said counterweight with respect to said horizontal swing axis, said boom and said counterweight support being supported about said horizontal swing axis so that the angular relationship therebetween may be selectively modified by said connecting means extending between said counterweight and the end of said extension of said boom.

4,449,635

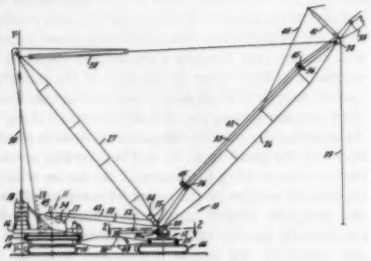
IMAGINARY PIVOT LIFT CRANE

Percy R. Helm, and James G. Morrow, Sr., both of Manitowoc, Wis., assignors to The Manitowoc Company, Inc., Manitowoc, Wis.

Continuation-in-part of Ser. No. 128,139, Mar. 7, 1980, Pat. No. 4,358,021. This application Aug. 2, 1982, Ser. No. 404,435

Int. Cl.³ B66C *23/74*

U.S. Cl. 212—196 **5 Claims**



1. A lift crane with a separated front ring segment and rear works comprising, in combination, rear works including a counterweight supported by a rear transporter assembly; a frame carrying an arcuate horizontal track segment supported by a front transporter assembly; means connecting said rear works to said frame; a carrier mounted for horizontal movement on said track; a forwardly inclined boom and rearwardly inclined mast pivotally mounted for vertical movement on said carrier; means interconnecting the tip of said boom and the rearwardmost point of said mast to said rear works; means for moving said carrier across said track; a horizontal bracket mounted on said connection means between said frame and said rear works; and two equal-length elongated members, each having first and second ends, said first ends being pivotally connected to opposite sides of said carrier and said second ends being pivotally connected to the respective opposite sides of said bracket, said elongated members, bracket and carrier forming a quadrilateral in the shape of a truncated isosceles triangle when said carrier is centered on said track, the imaginary vertex of said truncated triangle being located on a vertical axis running through said rearwardmost point of said mast and constituting the center of rotation of said carrier as it traverses said track so that as said carrier, mast and boom traverse said track, said center of rotation remains substantially on said vertical axis keeping said rearwardmost point of said mast substantially stationary.

4,449,636

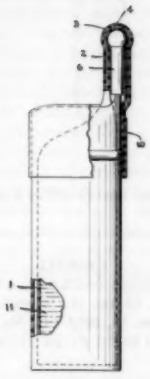
NURSING BOTTLE WITH DISPOSABLE INSERT

Wen-Yu Wu, 28925 Pinecastle Dr., Rancho P.V., Calif. 90274

Filed Jun. 3, 1982, Ser. No. 384,667

Int. Cl.³ A61J *9/00*

U.S. Cl. 215—11 E **12 Claims**



1. A disposable insert for a nursing bottle comprising: a flexible container having an opening at one end; a first perforated nipple integral with the wall of the container and projecting outwardly therefrom; a second smaller, imperforate nipple located diametrically opposite of said first nipple and projecting inwardly from said wall.

4,449,637

ANTI-TAMPERING DEVICES FOR BOTTLES

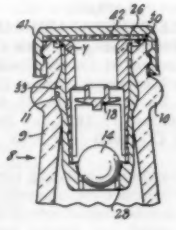
Robert Snedker, Hemel Hemstead, England, assignor to Seagram Distillers Limited, Paisley, Scotland

Continuation-in-part of Ser. No. 242,352, Mar. 10, 1981, Pat. No. 4,377,242. This application Sep. 28, 1982, Ser. No. 425,757

Claims priority, application United Kingdom, Mar. 12, 1980, 8008356; Jan. 29, 1982, 8202517

Int. Cl.³ B65D *49/02*

U.S. Cl. 215—21 **19 Claims**



1. An anti-tampering bottle closure comprising an outer member in the form of a sleeve which is insertable into a neck of a bottle, an inner member in the form of a tubular valve body made of a substantially more rigid material than that of the sleeve and a ball valve trapped within the valve body and adapted to allow liquid to be poured from the bottle when it is inverted but prevent liquid from being poured into the bottle when it is upright, said sleeve having a thickened wall portion and the valve body being axially insertable into the sleeve whereupon the insertion of the valve body into the sleeve and neck causes the thickened wall portion to permanently compress against the neck of a bottle and thereafter resist radially

inward deformation of the thickened wall portion of the sleeve to thereby lock the closure in the neck of a bottle.

4,449,638

TAMPER-RESISTANT AND CHILD-RESISTANT CLOSURE AND CONTAINER ASSEMBLY

Eugene E. Davis, Ilford, England, assignor to Johnsen & Jorgensen (Plastics) Ltd., London, England

Filed Jun. 23, 1983, Ser. No. 507,120

Claims priority, application United Kingdom, Dec. 9, 1982, 8235090

Int. Cl.³ B65D *55/02*

U.S. Cl. 215—211 **8 Claims**

1. A container and closure assembly wherein the container has an open mouth, a rim around the mouth, a cut-out in the rim and annular closure retaining means below the rim and wherein the closure has a top to close the mouth of the container, an inner depending plug to enter the mouth of the container, a tear band, means shaped to engage with the closure retaining means on the container and thumb-receiving recess in the plug.

4,449,639

TAMPER-RESISTANT AND CHILD-RESISTANT CLOSURES

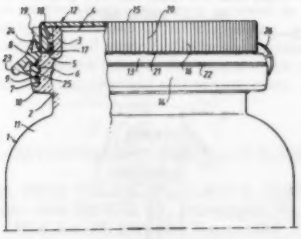
Eugene E. Davis, Ilford, England, assignor to Johnsen & Jorgensen (Plastics) Ltd., London, England

Filed Feb. 28, 1983, Ser. No. 470,508

Claims priority, application United Kingdom, Dec. 13, 1982, 8235409

Int. Cl.³ B65D *55/02*

U.S. Cl. 215—224 **10 Claims**



1. A closure for a container which has a hollow body and a mouth through which access can be obtained to the inside of the body, a rim around the mouth and a substantially horizontal outwardly projecting arcuate bead below the rim, wherein the closure has a cap part with a depending skirt, at the top, a tear band in the middle and a captive band at the bottom and wherein the tear band is connected to the skirt of the cap part and to the captive band by lines of weakness to facilitate tearing away of the tear band, the skirt of the cap part having an internal projection which can pass through the opening in the arcuate bead on the container so that the internal projection can cooperate with the projecting bead in such a way that the cap part can be removed only when the projection is in vertical alignment with the opening characterised by the provision of a tell tale bridge member which is normally intact but which is broken when the tear band is removed to give immediate visual evidence that the contents of the container may have been tampered with.

4,449,640

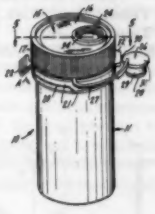
TAMPER-RESISTANT PHARMACEUTICAL VIAL AND CAP ASSEMBLY

Sam D. Finkelstein, Canton, Ohio, assignor to MPL, Inc., Canton, Ohio

Continuation of Ser. No. 413,623, Sep. 1, 1982. This application Sep. 19, 1983, Ser. No. 533,329

Int. Cl.³ B65D *53/00*

U.S. Cl. 220—270 **10 Claims**



1. In a tamper-resistant pharmaceutical vial and cap assembly comprising an open-top vial for dispensation of a predetermined dosage of a pharmaceutical preparation and a molded cap of resilient material mounted on and covering the top of the vial, said vial and cap assembly comprising:

a fill hole in the top of the cap affording access to the interior of the vial for filling the vial with the cap mounted on the vial; and

a stopper insertable in the fill hole to close and seal the fill hole after filling of the vial, the stopper having a configuration effectively precluding manual removal of the stopper from the fill hole after insertion therein.

4,449,641

CONTAINER OF PLASTIC MATERIAL WITH A LID

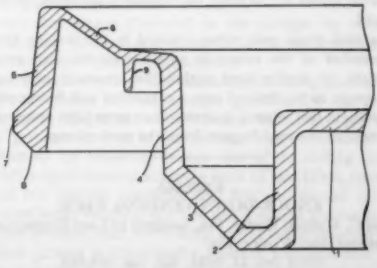
Knud E. Jorgensen, Haarby, and Ole Ingemann, Tasinge, both of Denmark, assignors to D.M.E. Plastic A/S, Haarby, Denmark

Filed Jun. 4, 1982, Ser. No. 385,119

Claims priority, application Denmark, Jun. 11, 1981, 2561/81

Int. Cl.³ B65D *41/16, 41/18*

U.S. Cl. 220—306 **8 Claims**



1. A container and lid assembly formed of a plastics material, said container comprising a container wall having at its upper

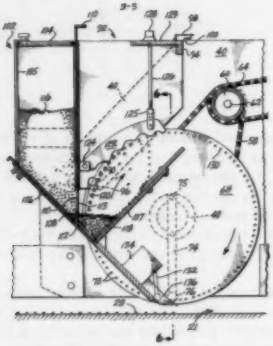
edge an exterior annular protecting member having a flange extending substantially parallel to said container wall over substantially the full periphery of the container and forming therebetween an upwardly facing annular recess, said protecting member being connected with the exterior side of the container wall through an inclined wall sloping downwardly from the container wall toward the lower edge of the flange, said lid having a skirt depending from the outer periphery of said lid and fitting into the upwardly facing annular recess of the container, the flange of the protecting member being provided at its upper edge with an inwardly extending bead and the skirt of the lid being provided at its lower edge with an outwardly extending bead which in the closed position of the lid is located below the inner bead of the flange of the protecting member and is in locking contact with that flange.

4,449,642

SEED PLANTER

James H. Dooley, Federal Way, Wash., assignor to Weyerhaeuser Company, Tacoma, Wash.

Filed Mar. 18, 1983, Ser. No. 476,737
Int. Cl.³ A01C *7/04*
U.S. Cl. 221—211 **20 Claims**



1. In a sower unit for a seed planter of the type having opposed rotating vacuum-type seeder discs, an easily removed seed hopper which comprises:

a. a frame containing a seed reservoir having a downwardly sloping bottom member adapted to fit snugly between the seeder discs, said member further having an angularly attached seed retainer plate which defines a seed supply trough between the discs;

b. indexing means associated with the frame for mounting the hopper in a precise predetermined location with respect to the seeder discs;

c. latch means for securing the hopper in operating position; and

d. a seed drain gate means located in the sloping bottom member of the reservoir adjacent to the seed retainer plate, to enable seed within the reservoir and supply trough to be drained into a container and be recovered without loss when it is desirable to empty the reservoir or remove the seed hopper from the seed planter.

4,449,643

KNOCK-DOWN VENDING RACK

Ronald C. Voegeli, Venice, Fla., assignor to Leco Engineering & Machine, Inc., Venice, Fla.

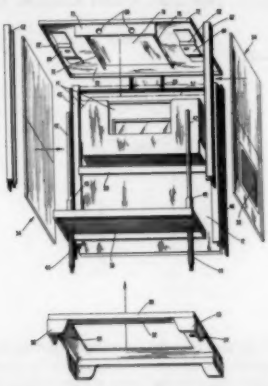
Filed Jul. 21, 1981, Ser. No. 285,441
Int. Cl.³ B65H *1/04*
U.S. Cl. 221—226 **18 Claims**

1. A knock-down vending rack suitable for transport in an unassembled state and adapted to be readily assembled in situ, comprising:

a rectangular top frame member having means defining a channel adjacent each of the peripheral edges thereof;

a rectangular bottom frame member having means defining a channel adjacent each of the peripheral edges thereof;

four wall panels each having a top edge and a bottom edge adapted to be received in respective channels in said top and bottom frame members;



a pair of rods each comprising a single member whose opposite ends are respectively connected to said top and bottom frame members to inhibit displacement of said frame members relative to one another and thereby clamp said wall panels in their associated channels between said frame members to define an enclosure, said rods being disposed within said enclosure when connected between said top and bottom members; and

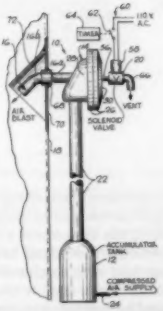
an elevator platform disposed within said enclosure and adapted for sliding movement along said rods.

4,449,644

BLAST AERATOR FOR FLUIDIZING GRANULAR MATERIAL

Carl G. Matson, Little Rock, Ark., assignor to Ludlow Industries, Inc., Elburn, Ill.

Filed Jun. 18, 1981, Ser. No. 274,737
Int. Cl.³ B65D *88/70*
U.S. Cl. 222—3 **20 Claims**



1. A blast for quickly releasing a volume of compressed air to form an aerating air blast for facilitating the flow of granular material or the like, comprising

a container for holding a volume of compressed air,

means for supplying compressed air to said container,
an aerator valve including a valve casing,
air blast outlet means connected to said valve casing,
air conduit means connected between said container and said valve casing,
said valve casing having a diaphragm chamber therein,
a flexible resilient diaphragm extending across said diaphragm chamber and dividing said diaphragm chamber into first and second chamber portions on opposite sides of said diaphragm,
said valve casing including outlet port means communicating with said first diaphragm chamber portion and connecting with said air blast outlet means,
said diaphragm having a valve member for selectively closing and opening said outlet port means,
said valve member and said diaphragm being movable between a closed position in which said outlet port means is closed by said valve member and an open position in which said valve member is moved away from said outlet port means to open said outlet port means,
said valve member being biased toward said closed position by the resilience of said diaphragm,
said valve casing having an inlet opening affording communication between said first diaphragm chamber portion and said air conduit means,
said valve casing including a vent opening communicating with said second diaphragm chamber portion,
said aerator valve including bleed means forming restricted communication between said first and second diaphragm chamber portions for supplying compressed air to said second diaphragm chamber portion when compressed air is supplied to said first diaphragm chamber portion from said container through said air conduit means,
and valve means connecting with said vent opening and operable between closed and open positions for selectively closing and opening communication between said second diaphragm chamber portion and a low pressure exhaust connection,
said valve means when closed being effective to allow said first and second diaphragm chamber portions to become pressurized with compressed air while said valve member is in its closed position,
said valve means when open being effective to exhaust the compressed air from said second diaphragm chamber portion whereupon the compressed air in said first diaphragm chamber portion acts upon said diaphragm to move said valve member to its open position whereby the compressed air in said container is quickly released and discharged as an air blast from said air blast outlet means,
said valve member thereupon being returned to its closed position by the resilience of said diaphragm,
said container and said aerator valve being separate modules,
said air conduit means being in the form of a pipe connected between said container and said aerator valve.

4,449,645

DENTAL CONTAINER AND AMALGAM DISPENSING METHOD

Paul Korwin, 150-09 77th Ave., Flushing, N.Y. 11367, and Robert Korwin, 3400 Red Lion Rd., Philadelphia, Pa. 19113

Filed Jun. 15, 1981, Ser. No. 273,914
Int. Cl.³ A61C 5/06
U.S. Cl. 222—49 **14 Claims**

1. A dental container for receiving and separately storing at least two dental preparation ingredients until they are subsequently brought together and mixed within the container, for making a settable, semi-solid dental preparation ready for use, said container comprising:

(a) a housing having a longitudinal axis, a filler opening at one end region of the housing, a discharge port at the opposite end region of the housing, a discharge port at the opposite end region of the housing, and interior wall portions bounding an interior multi-compartment chamber which extends longitudinally intermediate the filler opening and the discharge port, said chamber having a first storage compartment in which one of the ingredients is initially receivable, a second storage compartment in which the other of the ingredients is receivable, and a transfer compartment intermediate the storage compartments;

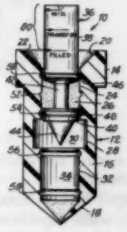
(b) a longitudinally-extending plunger mounted within the chamber for londitudinal movement therealong, said plunger having a main shaft portion, an auxiliary shaft portion spaced londitudinally from the main shaft portion, and a reduced cross-section connecting shaft portion intermediate the main and auxiliary shaft portions;

(c) first and second sealing means respectively mounted on the main and auxiliary shaft portions for joint movement therewith;

(d) said plunger being manually movable in direction longitudinally of the chamber among

(1) a filled position in which the first and second sealing means sealingly engage longitudinally spaced-apart wall portions of the chamber to thereby define in the circumambient region of the connecting shaft portion the first storage compartment wherein said one ingredient is sealingly contained prior to mixing,

(2) a transfer position in which the second sealing means is disengaged from the wall portions bounding the first storage compartment, and in which the first and second storage compartments communicate with each other via the transfer compartment, to thereby permit transfer



of said one ingredient through the transfer compartment and thereupon to the second storage compartment, and

(3) a mix position in which the second sealing means sealingly engages wall portions of the chamber which are longitudinally spaced from the discharge port to define therebetween the second storage compartment wherein both ingredients are sealingly contained during mixing;

(e) openable closure means at the discharge port for permitting discharge of the mixed ingredients upon opening of the closure means;

(f) indicator means displayed on the plunger for visually indicating each of said filled, transfer and mix plunger positions to a dental operator; and

(g) tactile sensory means for manually detecting each of said filled, transfer and mix plunger positions by the dental operator, said tactile sensory means including a plurality of grooves formed in the interior wall portions of the chamber for receiving at least one of the sealing means with snap-in locking action in each of said filled, transfer and mix plunger positions, said first and second sealing means being received in a first and a second groove in the filled position, said first sealing means being received in a third groove in the transfer position, and said first and second sealing means being received in the second and a fourth groove in the mix position, whereby the dental operator is simultaneously visually and tactilely advised of each of said plunger positions.

4,449,646

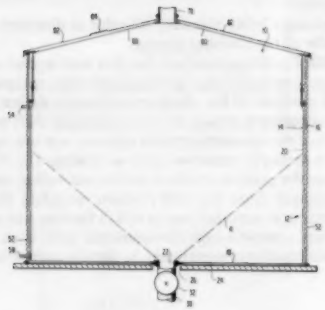
BIN FOR STORING AND DISCHARGING FREE-FLOWING GRANULAR MATERIAL

Timothy C. Bonerb, and Vincent C. Bonerb, both of P.O. Box 1997, Buffalo, N.Y. 14219

Continuation-in-part of Ser. No. 257,604, Apr. 27, 1981. This application Sep. 30, 1981, Ser. No. 307,089

Int. Cl.³ B65D *88/62*

U.S. Cl. 222—95 7 Claims



1. A bin for storing and discharging free-flowing granular material, comprising;

(a) a cup-shaped bag of flexible, fluid-impervious material having two walls capable of holding a fluid under low pressure therebetween, the cup-shaped bag having a bottom and inner and outer side walls.

(b) a discharge opening extending through the two walls of the cup-shaped bag in the bottom thereof,

(c) a floor supporting the entire bottom of the cup-shaped bag and having a discharge opening corresponding to the discharge opening in the bottom of the cup-shaped bag,

(d) means for supporting and holding up the top only of the side walls of the flexible cup-shaped bag,

(e) means for fixedly anchoring the bottom of the outer side wall only of the cup-shaped bag to the floor,

(f) means for creating slack in the inner side wall of flexible material of the cup-shaped bag wall near the top thereof and at a position which is always above the maximum height of the top of the free-flowing material after it has assumed its angle of repose, the means creating slack eliminating undue stress in the flexible material forming the inner side wall,

(g) means for controlling flow of the granular material from the discharge opening,

(h) means for supplying fluid material between the walls of the cup-shaped bag in the area of the created side wall slack so that when said fluid is supplied after the free-flowing granular material has been discharged down to its angle of repose, the flexible innermost wall of the cup-shaped bag will expand inwardly from the top moving downwardly to completely discharge the contents of the bin, and

(i) a back-up wall outside the outer side wall of the cup-shaped bag.

4,449,647

HANDLE ASSEMBLY FOR A PRESSURIZED DISPENSING CONTAINER

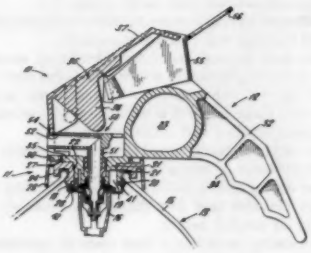
Norman L. Reed, and Trevor D. Parkin, both of Kings Lynn, England, assignors to Bespak Industries Limited, Norfolk, England

Filed Aug. 2, 1982, Ser. No. 403,967

Claims priority, application United Kingdom, Aug. 10, 1981, 8124415

Int. Cl.³ B67B *5/00*; B67D *5/32*

U.S. Cl. 222—153 11 Claims



1. A handle assembly for a pressurized dispensing container having a valve closing off an open end of the end of the container and including a valve cup with an inward-facing peripheral groove, the handle assembly comprises a collar for fitting over the valve cup of a container to which the handle assembly is fitted in use, and a handle, includes the collar at least one resilient leg having a bulbous portion for engaging the peripheral groove, interengaging means being provided on the handle and the collar for attaching the handle to the collar, said interengaging means including means for engaging at least one leg of the collar when assembled whereby to prevent disengagement of the leg from the groove.

4,449,648

MOBILE SPREADER UNIT

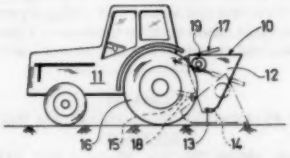
Kurt Gustavsson, Pilagarden, Fjäras, Sweden (430 33)

Filed May 4, 1981, Ser. No. 259,974

Claims priority, application Sweden, Jan. 26, 1979, 7900705

Int. Cl.³ A01C *5/00*

U.S. Cl. 222—164 1 Claim



1. A mobile spreader unit, comprising a tractor having front wheels, big, spaced apart rear wheels and tool supporting brackets between said big rear wheels and inside the perimeter thereof, as well as a detachable hopper for optional connection to said brackets,

said hopper being defined by front, rear and side walls, the breadth between said side walls permitting the hopper, in use, to fit in between said big, spaced apart rear wheels, and said front and rear walls tapering downwardly towards an elongate spreader opening,

agitator means in said hopper adjacent to said opening and driving means for said agitator means, including a roller mounted at one of said side walls adjacent to said front

wall, and adapted to be brought into contact with one of said big rear wheels,

pivot means at said front wall adjacent to said spreader opening for attachment to said brackets and located so the point of gravity of said hopper tends to tilt the hopper away from the tractor when the hopper is mounted on said brackets, said pivot means permitting a tilting movement of the hopper until said rear wall occupies a substantially horizontal position, the distance between said front and said rear walls at the level of said pivot means corresponding to about the distance between the ground and said pivot means,

said supporting brackets defining lower struts connected at one end to lower attachment points of said tractor and at the other end to said pivot means, and

pressure fluid actuated means, connecting the upper portion of said front wall with an upper attachment point of said tractor for raising said hopper from a position where said rear wall occupies a substantially horizontal position, to an upright position where said agitator driving roller contacts one of said big tractor rear wheels, said pressure fluid actuator means defining an upper strut and comprising a hydraulic cylinder assembly having a fixed piston connected to said tractor at said upper attachment point and a moveable cylinder attached, intermediate the ends thereof, to said upper portion of said front wall.

4,449,649

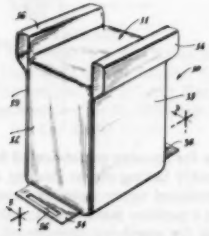
BULK MATERIAL CONTAINER

Jerry E. Flannigan, Century, Fla., assignor to St. Regis Paper Company, West Nyack, N.Y.

Continuation-in-part of Ser. No. 316,219, Oct. 29, 1981, abandoned. This application Jan. 15, 1982, Ser. No. 339,423

Int. Cl.³ B67D *5/06*

U.S. Cl. 222—181 **11 Claims**



1. A bulk material container comprising:

a sidewall,

a bottom wall closing one end of said sidewall, said bottom wall including a dispensing opening therethrough,

a multi-ply looped sling extension wrapped around said container to enclose said bottom wall and opposite portions of said sidewall, thereby forming a sling for supporting and transporting said container, each of the plies of said looped sling extension which are adjacent said bottom wall including a dispensing opening therethrough, said dispensing openings all being in registration with each other;

slide valve means between a pair of adjacent plies of said multi-ply looped sling extension for controlling the rate of flow of bulk material dispensed from said container through said dispensing openings, said slide valve means including:

a push-pull plate so proportioned and constructed as to permit pushing and pulling at each end of the plate against the load of the material and having an opening extending therethrough which is adapted to be placed in and out of or in partial registration with the registered openings in said bottom wall and the plies of said looped sling extension, and

handle means on each end of said push-pull plate for gripping and pushing and pulling said push-pull plate from opposite sides thereof.

4,449,650

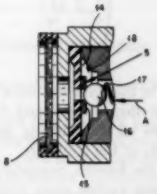
METERING PUMP ESPECIALLY FOR VOLATILE MATERIALS

Harry Sawatzki, Vaduz, Liechtenstein, assignor to Censor Patent- Und Versuchs-Anstalt, Vaduz, Liechtenstein

Filed Nov. 19, 1981, Ser. No. 323,082

Int. Cl.³ B65D *88/54;* **B67D** *5/40*

U.S. Cl. 222—309 **3 Claims**



1. A dosing pump, especially for a flowable material containing a volatile substance, comprising:

a pump housing formed with a pump chamber;

a drive member displaceable in said chamber to vary the effective volume thereof in a feed stroke driving said material from said chamber and an intake stroke drawing said material into said chamber;

means connected to said drive member for displacing same in said chamber;

an intake valve connected to said chamber for unidirectionally admitting said material to said chamber during said intake stroke;

a discharge valve connected to said chamber for unidirectionally permitting outflow of said material from said chamber;

a discharge passage connected to said discharge valve for conducting said material therefrom; and

displacement means including a displacement body disposed between said discharge passage and said chamber and displaceable during an initial portion of said feed stroke to force a quantity of said material along said passage, said quantity of material being less than the quantity of material displaced by said drive member during said feed stroke and determined by the extent of movement of said displacement body whereby movement of said displacement body during said intake stroke retracts material in said passage, thereby reducing exposure of a boundary surface of said material to the environment, said displacement body comprising a membrane disposed in a path between said passage and said chamber, a stop formed by an end of said passage proximal to said membrane for limiting the deflection of said membrane during said feed stroke, said discharge valve including a valve seat formed on said membrane, said membrane being prestressed in a manner tending to draw it toward said chamber.

4,449,651

TUBULAR METERING OR DOSING MECHANISM FOR DISPENSING LIQUID FROM A CONTAINER IN SUCCESSIVE QUANTUMS OF UNIFORM VOLUME

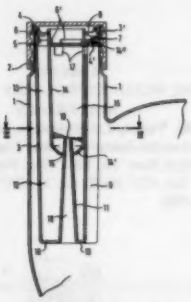
Eberhard Roder, deceased, late of Bad Schwartau, Fed. Rep. of Germany; by Hans-Dieter Borchers, administrator, Lübeck, Fed. Rep. of Germany, and Wolfgang Düsing, Zarpen, Fed. Rep. of Germany, assignors to Gottfried Roder Kunststoffwerk, Lübeck, Fed. Rep. of Germany

Filed Mar. 23, 1982, Ser. No. 361,050

Claims priority, application Fed. Rep. of Germany, Mar. 24, 1981, 3111503

Int. Cl.³ G01F *11/26*

U.S. Cl. 222—455 14 Claims



1. For mounting in the dispenser neck of an invertable container for liquid for dispensing liquid from the container in successive quantums of substantially uniform volume upon successive inversions of the container,

a tubular dosing mechanism, comprising:

external wall means having outer peripheral surface means constructed and arranged to circumferentially sealingly engage the dispenser neck when the tubular dosing mechanism is introduced into the dispenser neck;

first wall means defining a discharge channel having an axial extent, being outwardly open, relative to the dispenser neck into which the tubular dosing mechanism is to be introduced, and having an opposite, inner end closed by base wall means;

second wall means defining a dosing channel extending axially internally of said first wall means and including means closing the outer end thereof relative to the dispenser neck into which the tubular dosing mechanism is to be introduced;

said second wall means providing a partition between said discharge channel and said dosing channel, said partition terminating axially outwardly of said base wall means, so that between said base wall means of the discharge channel-defining first wall means and where said partition terminates a collecting region is provided, said collecting region connecting with both the dosing channel and the discharge channel, and having a volume at least as large as said uniform volume;

means defining a liquid inlet opening into said tubular dosing mechanism and means defining a liquid outlet opening from said tubular dosing mechanism, both said openings being communicated to externally of the tubular dosing mechanism for communication internally of the container for liquid when the tubular dosing mechanism is introduced and sealed in the dispenser neck of such container;

the axial spacing between said inlet and outlet openings being such as to cause there to be admitted from the container to the tubular dosing mechanism upon inversion of the container when the tubular dosing mechanism is introduced and sealed in the dispenser neck of such container an amount of liquid corresponding to said uniform volume;

the axial spacing between said outlet opening and where said partition terminates providing a storage region having a volume that is as large as half that of the maximum free liquid which occurs upon an inversion of the container when the tubular dosing mechanism is introduced and sealed in the dispenser neck of such container;

said outlet opening being located axially inwardly of said inlet opening;

wall means defining an axially extending tubular channel opening externally through said base wall means at an inner end and having said outlet opening defined at an outer end thereof, said outlet opening being located within said dosing channel; and

an orifice plate mounted in place covering said inner end of said tubular channel, said orifice plate having an orifice having a diameter which is one-half to one-fifth the diameter of said inner end of said tubular channel axially outwardly adjacent to said orifice plate.

4,449,652

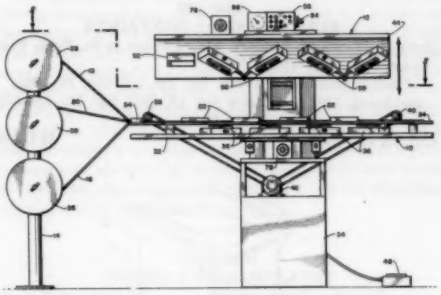
PREFABRICATED BOW FORMING MACHINE

Timothy G. Coppins, 10737 Rose Ave., Ontario, Calif. 91761, and Jerry B. Coppins, 4538 Bodega Ct., Montclair, Calif. 91763

Filed Jan. 5, 1983, Ser. No. 455,749

Int. Cl.³ A41H *43/00*

U.S. Cl. 223—46 8 Claims



1. A machine for forming prefabricated bows comprising:

a lower assembly having means forming a guide track;

a movably mounted upper assembly being movable to and away from a position juxtaposed to said lower assembly;

supply means for supplying preselected lengths of mated ribbon material having a strap centrally disposed therebetween to the track on said lower assembly;

fastening means securely fastening said preselected lengths of ribbon material and said strap together at one end;

a plurality of heating elements on said lower assembly;

a plurality of heating elements on said upper assembly;

said upper assembly heating elements mating with said lower assembly with said preselected length of ribbon and strapping material therebetween when said upper assembly is moved toward said lower assembly;

said heating elements on said upper and lower assemblies being constructed and arranged to bond said ribbons together at preselected intervals by producing a plurality of heat welded seams with adjacent seams being at angles opposite to one another and at approximately 45 degrees.

4,449,653

BICYCLE STORAGE TRUNK

Robert J. Pirolli, 6500 Torresdale Ave., Philadelphia, Pa. 19135

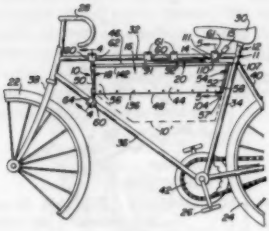
Filed Dec. 11, 1981, Ser. No. 329,628

Int. Cl.³ B62J *7/02*

U.S. Cl. 224—35 2 Claims

1. For a closed frame bicycle which includes a frame portion

comprising a top tube, a down tube and a seat tube collectively defining an open space therebetween, said frame portion lying in a common plane, a storage trunk comprising an enclosed housing, entrance means for affording access into the interior of said enclosed housing, means for pivotably mounting said housing on said bicycle frame within said open space and enabling said housing to be pivoted between a first and a second position and vice versa, whereupon when said housing is in said first position said housing is disposed generally within said plane, with a part of said frame precluding access into said housing through said entrance means, and when said housing is



in said second position said housing is disposed at an angle from the plane of said frame portion to expose said entrance means to enable one to have access into said housing therethrough, and means for locking said housing in said first position, wherein said housing further includes a first end and a second end such that the first end is pivotably connected to said top tube and to said down tube of said frame to enable said second end of said housing to rotate out of said common plane, and said locking means includes means for releasably securing a portion of said housing adjacent said second end, to said top tube.

4,449,654

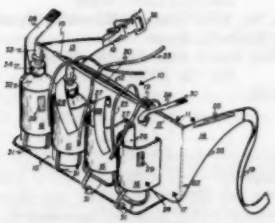
BELT SUPPORTED BACKPACK

Lona P. Cappis, 30 Glenview Ct., Los Alamos, N. Mex. 87544

Continuation-in-part of Ser. No. 217,859, Dec. 18, 1980, abandoned. This application Jan. 11, 1982, Ser. No. 338,277

Int. Cl.³ B65D *23/08*

U.S. Cl. 224—148 **11 Claims**



1. A belt-support fluid-carrying backpack adapted to be secured around the midriff which comprises in combination (a) an alongated flexible belt having a relatively wide intermediate section and sections tapering from said intermediate section to straps forming the free ends of said belt, (b) fastener means at at least one of the free ends of said belt for releasing and adjustably securing said free ends together, (c) a plurality of substantially vertical, open topped, open bottomed pockets affixed to said intermediate section of said belt, said pockets adapted to provide easy access thereto for removal and replacement of objects carried therein by the person carrying the pack while said person is running, walking, or skiing, (d) means at the base of said pockets for supporting objects in place in said pockets, and (f) a plurality of potable fluid-carrying containers in place in said pockets.

4,449,655

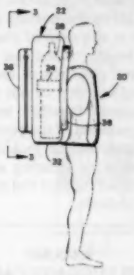
COMBINATION BACKPACK AND GEAR BAG

Patrick P. Germe, Irvine, Calif., assignor to U.S.D. Corp., Santa Ana, Calif.

Filed Oct. 5, 1981, Ser. No. 308,145

Int. Cl.³ A45F *3/00*

U.S. Cl. 224—153 **4 Claims**



1. A gear bag for receiving a backpack connected thereto comprising:

opening and closing means so that said bag can be opened and closed;

a major surface of said bag having a passage therethrough for receipt of a breathing gas tank connection means extending from a backpack so that said gear bag can receive a breathing gas tank therein and can be carried by being supported thereon when said breathing gas tank is held by a backpack carried by a user;

an external compartment in surrounding relationship to said passage therethrough having a major flap for providing said compartment with means wherein said compartment can receive the backpack therein when said gear bag is not being carried by the backpack; and,

closure means for said compartment by means of attaching said flap in said overlying relationship to said backpack as it is received within said compartment.

4,449,656

LOAD CARRIER FOR VEHICLES

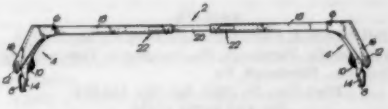
Adriaan v. d. Wouden, Ulvenhout, Netherlands, assignor to Industri AB Thule, Hillerstorp, Sweden

Filed Apr. 14, 1983, Ser. No. 484,967

Claims priority, application Sweden, Apr. 21, 1983, 8202491

Int. Cl.³ B60R *9/04*

U.S. Cl. 224—320 **5 Claims**



1. A luggage carrier for vehicles comprising a support rod (2) and support legs (4) connected with the ends of the support rod, the support legs having fastening devices (8,10) for fastening the luggage carrier to a vehicle, the support rod (2) comprising two telescoping portions (18,20) which are telescopically displaceable in relation to each other in order to allow adjustment of the length of the support rod whereby the luggage carrier may be adapted to the width of the vehicle, and to allow the support rod to be dismounted or its portions to be

pushed together to a space-saving relationship, the support rod also comprising a locking device (22) for securing the two portions of the support rod in the desired relative position, said locking device comprising two complementary, interengageable locking means (20, 30, 32), one of said locking means being on and belonging to each of the portions (18, 20) of the support rod, for securing the portions of the support rod in fixed relation to each other when the locking means are in engagement with each other and allowing the support rod to be dismounted or its portions to be pushed together when the locking means are out of engagement with each other, characterized by means for securing at least one (24–30) of the locking means of the locking device (22) to the portion (20) of the support rod (2) belonging thereto at any desired position within a range of positions along the length of the last-mentioned portion regardless of the relative positions of the two telescoping portions and regardless of whether or not the two portions of the support rod are secured together by the locking device, whereby the relative position of the portions of the support rod when the locking means of the locking device engage each other can be established by securing said one of the locking means to its portion of the support rod before installation of the luggage carrier on a vehicle.

4,449,657

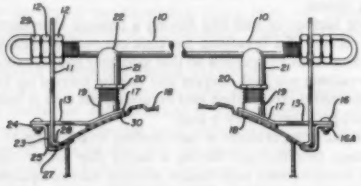
AUTO LUGGAGE CARRIER

Frank Moran, 5214 Viola Dr., Austintown, Ohio 44515

Filed Jul. 21, 1982, Ser. No. 400,463

Int. Cl.³ B60R *9/04*

U.S. Cl. 224—329 **5 Claims**



1. An auto luggage carrier for mounting on the roof of a vehicle, said carrier having multiple support units, each unit comprising at least one bar positioned transversely of said vehicle's roof, dual means for adjustably supporting said bar on said vehicle, threaded end portions on said ends of said bars, a pair of spaced threaded nuts on said threaded end, an apertured bracket secured to said bar between said spaced nuts and extending to the roof of said vehicle, a post having threads adjacent an end, a sleeve movably positioned on said post, a bifurcated bracket secured to said post and removably secured to said apertured bracket, means for securing said apertured bracket and said bracket to a vehicle's top and wherein said dual means for adjustably supporting said bar are spaced with respect to one another.

4,449,658

ADJUSTABLE INPUT SHAFT FOR PRESS FEED

Joseph P. Gentile, Pittsburgh, Pa., assignor to Vamco Machine & Tool, Inc., Pittsburgh, Pa.

Filed Nov. 26, 1982, Ser. No. 444,604

Int. Cl.³ B65H *17/26*

U.S. Cl. 226—138 **10 Claims**

1. Apparatus for intermittently feeding a workpiece to a press comprising,

press drive means for generating continuous rotation at a predetermined speed,

a machine frame,

an input shaft supported for rotation in said machine frame,

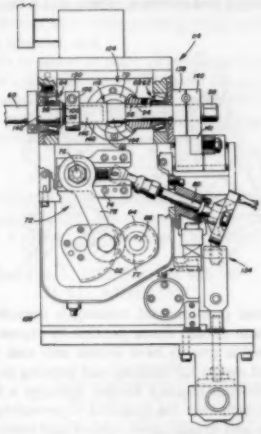
said input shaft having a first portion and a second portion,

clamp means for releasably engaging said input shaft first portion to said input shaft second portion to permit relative rotation between said input shaft first and second portions,

said press drive means being drivingly connected to said input shaft first portion to rotate said input shaft at said predetermined speed,

feed means supported in said frame for intermittently feeding a preselected length of the workpiece to the press,

rotation transmission means supported in said machine frame for drivingly connecting said input shaft second portion to



said feed means to convert the continuous rotation of said input shaft to intermittent rotation of said feed means and intermittently feed a preselected length of the workpiece to the press in timed relation with the press operation, and

said clamp means being releasable to drivingly disconnect said input shaft first portion from said input shaft second portion to permit relative rotation between said first and second portions and allow adjustments in the timed relation between the feeding of the workpiece to the press and the operation of the press on the workpiece.

4,449,659

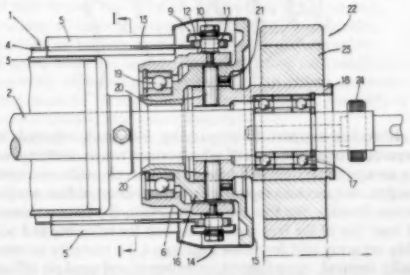
ROLLER FOR ADJUSTING THE WIDTH OF A TRAVELLING WEB

Isamu Tuchida, No. 1-24, Ōyamasakihiroshiki, Ōyamasaki-cho Otokuni-gun, Kyōto-fu, Japan

Filed Jun. 2, 1982, Ser. No. 384,425

Int. Cl.³ B65H *17/20*

U.S. Cl. 226—190 **4 Claims**



1. In a roller for adjusting the width of a travelling web including:

a core member;

a pair of inclinedly movable tension setting members disposed at the ends of said core members having a plurality

of universal joints arranged adjacent to the periphery of the roller; and

a plurality of elastic bands having surface frictional resistance which are axially arranged in a cylindrical shape around the circumference of said core member and stretchingly held between said tension setting members to which said bands are attached at each end;

said cylindrically arranged elastic bands being axially moved in succession according to the inclined movement of said tension setting members, while being rotated by the contact of the travelling web with said elastic bands,

the axial movement during rotation of said cylindrically arranged elastic bands causing the web to be similarly axially moved to a predetermined position, thereby to properly adjust the width of the travelling web;

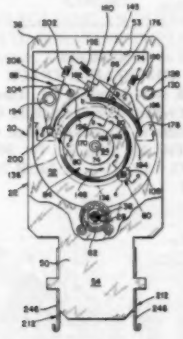
said roller characterized in that the both ends of said elastic bands are connected to said tension setting members through said universal joints.

4,449,660

FASTENER TOOL

Somers H. Smith, III, Columbia, Md., assignor to Black & Decker Inc., Newark, Del.

Filed Apr. 30, 1981, Ser. No. 259,456
Int. Cl.³ B25C *1/06*
U.S. Cl. 227—8 **23 Claims**



1. A fastener tool system, comprising:

(a) a source of rotational energy connected to the tool, and said source rotatable through a first cycle;

(b) a fastener to be driven by the tool;

(c) a drive member moveable in the tool through a second cycle defined by a power stroke to drive the fastener and a return stroke,

(d) means in the tool for linking the source of rotational energy to the drive member to drive the drive member through the power stroke and the return stroke, said means further including means for terminating successive second cycles while the source of rotational energy is continuously rotated.

4,449,661

STAPLING APPARATUS

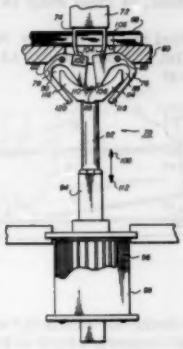
C. W. Spehrley, Jr., Quechee, Vt., assignor to Xerox Corporation, Stamford, Conn.

Continuation-in-part of Ser. No. 427,388, Sep. 29, 1982, abandoned, which is a continuation of Ser. No. 907,646, May 22, 1978, abandoned. This application Sep. 28, 1983, Ser. No. 535,551
Int. Cl.³ B27F *7/19, 7/36*
U.S. Cl. 227—155 **12 Claims**

1. An apparatus for stapling articles, including:

means for driving a staple through the articles so that a portion of the staple legs extend therethrough;

means for bending the portion of the staple legs protruding through the articles into substantial contact therewith so that the staple is clinched; and



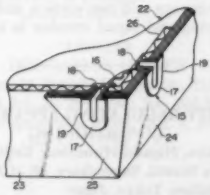
means for applying a force to said bending means which varies as the function of the distance said applying means translates, said bending means exerting a clinching force on the legs of the staple which varies as a function of the distance said applying means translates in substantially the same manner as the force applied thereon by said applying means.

4,449,662

CORNER HOLDER FOR USE WITH BOXES

Kouichi Okamura, Fukuoka; Yukio Eriguchi, Dazaifu; Katsushige Hagio, Kasuga, and Setsuo Yamamoto, Ashiya, all of Japan, assignors to Matsushita Electric Industrial Co., Osaka, Japan

Filed Aug. 10, 1982, Ser. No. 406,834
Int. Cl.³ B65D *6/24, 5/44*
U.S. Cl. 229—49 **16 Claims**



1. A corner holder for use with a collapsible box including a plurality of sidewalls having end flaps bent around box corners into superimposed relation to adjacent ones of the sidewalls, said sidewalls and end flaps which are superimposed having a pair of slots adjacent to each of said corners, said corner holder comprising:

a pair of inserts insertable substantially fully in the slots in the sidewalls of the box and each including a base plate having a substantially U-shaped peripheral edge and a continuous flange of an L-shaped cross section extending outwardly adjacent said peripheral edge, said base plate and said continuous flange jointly defining a substantially U-shaped groove opening outwardly along said U-shaped peripheral edge, said U-shaped groove being receptive of an edge of one of the slots in the sidewalls of the box when said insert is inserted in said slot; and

a flexible web interconnecting the base plates of said inserts and adapted to be positioned inside of the box corner

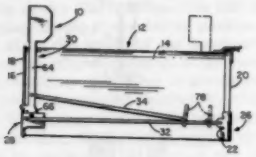
when said inserts are inserted respectively in the sidewalls of the box.

4,449,663

MAILBOX SIGNAL DEVICE

Harry C. Schluter, 94 Piney Ridge Dr., Hendersonville, N.C. 28739

Filed Sep. 19, 1983, Ser. No. 533,757
Int. Cl.³ B65D *91/00*; A47G *29/12*
U.S. Cl. 232—35 **10 Claims**



1. A signal device for attachment to a mailbox having an elongated mail receptacle closed at its rear end and a door hingedly connected to the mail receptacle at its front end for pivotal movement about a horizontal axis between open and closed position, the door in its closed position forming a closure for the front end of the mail receptacle, said signal device comprising a rear bracket for mounting on the mail receptacle and having an elongated slot therein, means for mounting said rear bracket in fixed position on said receptacle, a signal member pivotally supported on said rear bracket for movement between an inactive position and a signalling position and having a cam surface thereon, said cam surface extending transversely of said slot when said signal member is in its inactive position and extending in generally parallel relation to said slot when said signal member is in its signalling position, a front bracket, mounting means for securing said front bracket in fixed position to the door to move therewith, operating means for moving said signal member from its inactive position to its signalling position in response to movement of the door toward its open position and including an operating rod having one end portion connected to said front bracket and an opposite end extending through said slot to travel within said slot and cammingly engage said cam surface, and detent means for releasably securing said signal member in its signalling position.

4,449,664

AIR QUANTITY REGULATING APPARATUS FOR AIR CONDITIONING

Kuniaki Mitsuhira, Higashi-Hiroshima; Keiji Kamata, Yamato, and Hikoshiro Suzuki, Sagamihara, all of Japan, assignors to Topre Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 275,650, Jun. 22, 1981, abandoned. This application Jan. 19, 1983, Ser. No. 459,255
Claims priority, application Japan, Jun. 27, 1980, 55-90998
Int. Cl.³ F24F *13/10*
U.S. Cl. 236—49 **9 Claims**

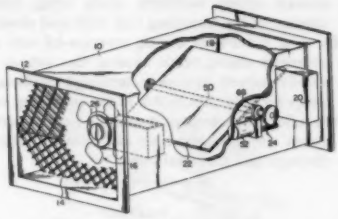
1. An air quantity regulating apparatus for air conditioning, which is used in a system for supplying air from an air conditioner to a plurality of zones to be air-conditioned through a duct so as to regulate an air-quantity supplied to each of the plurality of zones at a predetermined quantity regardless of a difference between pressures at different locations in the duct and a change in pressure at a signal location in the duct, comprising:

(a) a duct member which is disposed in the duct to supply the air from the air conditioner to the zone to be air-conditioned;

(b) an air quantity detector which is disposed in an air flow in said duct member to measure the quantity of air flowing from the air conditioner and which includes a rotary member rotated at a rotational frequency proportional to an air speed and a rotational frequency detector for detecting the rotational frequency of said rotary member;

(c) a throttle valve mechanism which is diposed downstream of said air quantity detector in said duct member to control the quantity of air flowing in said duct member;

(d) a driving means which is reversibly operated to drive said throttle valve mechanism;



(e) an air quantity setter which sets the quantity of air flowing in said duct member; and

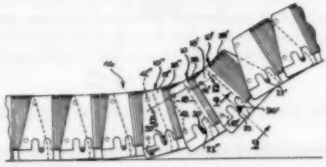
(f) a control means for controlling said driving means to make a preset air quantity set by said air quantity setter coincide with a detected air quantity detected by said air quantity detector.

4,449,665

ADJUSTABLE TRACK

Adolph E. Goldfarb, 4614 Monarca Dr., Tarzana, Calif. 91356, and Delmar K. Everitt, Woodland Hills, Calif., assignors to Adolph Eddy Goldfarb, Westlake Village, Calif.

Filed Feb. 10, 1982, Ser. No. 347,450
Int. Cl.³ A63H *18/04*; E01B *23/00*
U.S. Cl. 238—10 R **16 Claims**



1. An adjustable toy track element comprising:

a toy roadbed section; and

connecting means coupled to said roadbed section for fixedly but releasably locking said roadbed section at a selected generally vertical angle with a roadbed section having a like connecting means coupled thereto to form an adjustable track having a self-sustaining selected elevational contour.

4,449,666

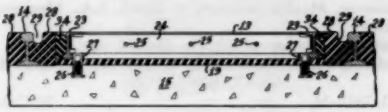
CONCRETE RAILROAD TIE FOR SUPPORTING GRADE CROSSING PANELS

Harvey E. Hales, and Edmund R. Fredrick, both of St. Augustine, Fla., assignors to Railroad Concrete Crosstie Corporation, St. Augustine, Fla.

Division of Ser. No. 69,292, Aug. 24, 1979, Pat. No. 4,267,969. This application May 8, 1981, Ser. No. 261,775
Int. Cl.³ E01B *3/28*; E01C *9/04*
U.S. Cl. 238—84 **2 Claims**

1. An elongated reinforced prestressed concrete railroad tie for positioning beneath and supporting throughout its length interior panels between railroad rails and exterior panels adja-

cent to and outwardly of each of the rails with the panels and rail upper surfaces being substantially in the same plane, said tie being generally square in cross section and approximately twice as long as the gauge of the rails it is designed to support, said tie having a multiplicity of non-adjustable spaced studs embedded therein and projecting vertically upward from the upper surface of said tie and entering outwardly unexposed



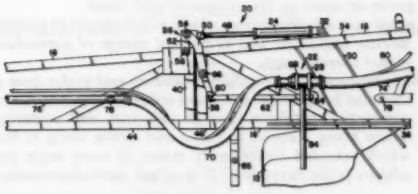
portions of the exterior and interior panels between the rails and the exterior panels adjacent to and outwardly of each of the rails and for permitting vertical movement of the interior and exterior panels with respect to said tie, said studs being the sole attachment to and non-supportive of the interior and exterior panels, said tie being adapted to be placed beneath and attached to the rails to support same thereon.

4,449,667

APPARATUS FOR FOLDING AN OUTBOARD BOOM ON A LIQUID SPRAYING IMPLEMENT

Loren E. Tyler, Benson, Minn., assignor to Lor-Al Corporation, Benson, Minn.

Filed Apr. 26, 1982, Ser. No. 371,817
Int. Cl.³ B05B *1/20*
U.S. Cl. 239—167 **5 Claims**



1. Apparatus for folding an outboard portion of a boom and controlling substance flow to ejection devices supported thereon, said boom having also an inboard portion, said apparatus comprising:

hinge means for pivotably connecting the inboard and outboard portions of said boom;

a valve connected between a source container in fluid communication with said ejection devices and said ejection devices on the outboard portion of said boom, said valve having an actuating member;

means for moving the outboard portion of said boom about the pivoted axis of said hinge means and simultaneously moving said valve actuating member, said moving means being attached directly to one of said inboard and outboard portions;

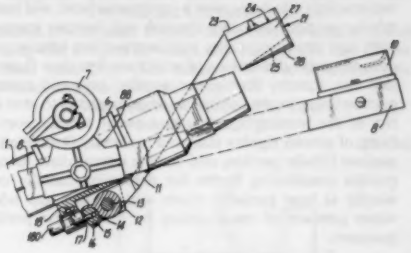
linkage means for connecting said moving means and the other of said inboard and outboard portions, said linkage means forming a common axis with a first element connected to said other of said inboard and outboard portions and a second element connected to said valve, said moving means moving said outboard portion and said valve actuating member simultaneously by moving said common axis.

4,449,668

IMPACT IRRIGATORS IN GENERAL

Arno Drechsel, Via Weggenstein, 29-39100 Bolzano, Italy

Filed Apr. 21, 1981, Ser. No. 256,193
Claims priority, application Italy, May 23, 1980, 46841 A/80
Int. Cl.³ B05B *3/02, 3/14*
U.S. Cl. 239—230 **6 Claims**



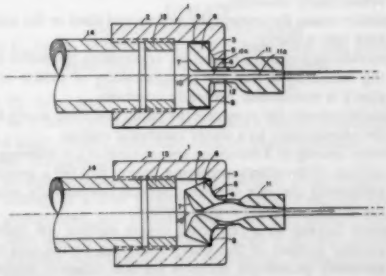
1. An improved impact irrigator of the type having an independent deflector for rapid return disposed at the end of a lever controlled by a reversing linkage, to rock between a position in which the deflector is completely outside the jet and a position in which the deflector is completely immersed in the jet for rapid return movement, of the irrigator wherein the reversing linkage which controls the rocking movements of the lever carrying the deflector comprises at least one connecting means movable between a first position in which the deflector is locked outside the jet, and a second position in which the deflector can enter the jet to cause rapid return, said connecting means comprising an element movable over-center to said first position and back through center to said second position, and wherein an inadvertent external force applied to said lever or said deflector tending to move the deflector toward said jet when said connecting means is in said first position acts to more firmly maintain said element in said over-center position and said lever in said first position in which the deflector is locked outside the jet thereby preventing inadvertent and accidental rapid return as a result of engagement of the lever or deflector by an operator working on the irrigator so that possible injury to the operator is avoided.

4,449,669

IRRIGATION DEVICE

Raphael Mehoudar, 36 Yehuda Hanassi St., Tel-Aviv, Israel

Filed Jul. 23, 1981, Ser. No. 286,354
Claims priority, application Israel, Aug. 6, 1980, 60775
Int. Cl.³ B05B *1/30*
U.S. Cl. 239—533.1 **8 Claims**



1. A water sprinkler device, including a nozzle housing, an aperatured end wall of the housing forming a rim defining an

aperture of said housing; and a nozzle unit, said nozzle unit comprising,

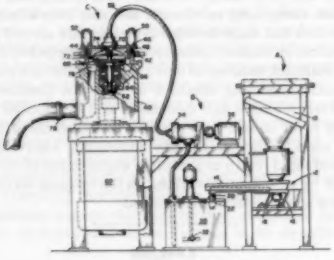
a resiliently flexible annular portion, a resiliently flexible intermediate tubular portion of substantially lesser wall thickness than that of the annular portion and an outlet tubular portion, said portions forming an integral unit with said annular portion merging continuously with the outlet tubular portion via said intermediate tubular portion and defining with the outlet tubular portion and the intermediate tubular portion a continuous bore, said outlet tubular portion extending through said housing aperture with said rim surrounding said intermediate tubular portion, the outer dimensions of which are less than those of said rim, thereby forming an annular gap, said annular portion being located within said housing so as to abut the rim of the housing aperture said outlet tubular portion being of greater rigidity than said resiliently flexible intermediate tubular portion, said flexible intermediate tubular portion constituting means for deforming radially outwardly at least partially within said annular gap when water pressure of water acting on the annular portion increases.

4,449,670

COMMINUTING APPARATUS WITH IMPROVED FEED SYSTEM

James J. Tloczynski, Parma; Clifford J. Ahola, Cleveland; Nicholas D. Rosenstein, Beachwood, all of Ohio, and James C. Rine, Lake City, Fla., assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Oct. 29, 1981, Ser. No. 316,216
Int. Cl.³ B02C *7/12*
U.S. Cl. 241—35 **14 Claims**



1. A comminuting apparatus comprising:

a hopper for holding pellets to be comminuted;

pellet feeding means for feeding the pellets from the hopper into a mixing tank at a selectable rate;

a level controlled valve for feeding a fluid into a mixing tank such that the fluid level in the mixing tank is maintained substantially constant;

agitator means for mixing the pellets and fluid in the mixing tank into a slurry;

concentration control means for controlling the pellet feeding means such that the concentration of pellets in the slurry is maintained generally constant;

pumping means for pumping the pellet and fluid slurry from the mixing tank to a slurry receiving region;

a stator having (i) a receiving region surface for defining one surface of the slurry receiving region and (ii) a generally peripheral abrasive surface disposed peripherally around the stator receiving region surface;

a rotor having (i) a receiving region surface for defining another surface of the slurry receiving region and (ii) a generally peripheral abrasive surface disposed peripherally around the rotor receiving region surface such that the slurry receiving region is defined generally between the rotor and stator receiving region surfaces and a grinding zone is defined between the rotor and stator peripheral abrasive surfaces; and

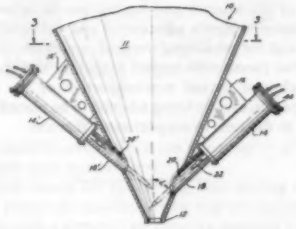
rotating means for rotating the rotor relative to the stator.

4,449,671

APPARATUS FOR SEPARATING AGGLOMERATED PARTICULATE MATTER

Enrique R. Martinez-Vera, and Gilberto Guerra-Garcia, both of Monterrey, Mexico, assignors to Hylsa, S.A., Monterrey, Mexico

Continuation-in-part of Ser. No. 254,441, Apr. 15, 1981, abandoned. This application Aug. 4, 1981, Ser. No. 289,998
Int. Cl.³ B02C *23/00*
U.S. Cl. 241—36 **26 Claims**



1. A containment and cluster-breaker apparatus for handling flowing particulate matter, comprising a moving bed reduction vessel for making sponge iron which particulate matter is subject to agglomeration,

said vessel for containing said particulate matter having a narrowed bottom discharge port and further having a defined direction of flow of particulate matter contained therein,

a probe mounted on the exterior of said vessel,

a probe port into the interior of said vessel shaped to accommodate said probe and to prevent escape of particulate matter therethrough,

actuating means for forcefully extending said probe from a retracted position into the vessel and retracting it back out completely therefrom through said port, said actuating means being adapted to move said probe along a line which extended downwardly makes an acute angle (α) relative to the direction of flow of said particulate matter.

4,449,672

MACHINE FOR LOADING AND DISINTEGRATING LARGE BALES OF FORAGE MATERIAL

Ruben D. Morlock, Jamestown; Ivyl D. Kopecky, Ypsilanti, both of N. Dak.; Robert R. Anderson, Windsor, and Dewey R. Marcy, Greeley, both of Colo., assignors to Haybuster Manufacturing, Inc., Jamestown, N. Dak.

Filed May 29, 1981, Ser. No. 268,341
Int. Cl.³ B02C *18/22*
U.S. Cl. 241—101.7 **17 Claims**

1. A machine for grinding large bales of forage material comprising a support frame;

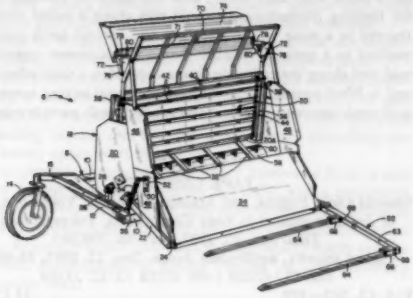
bale support means mounted on said frame and positioned so that a bale supported on said bale support means is urged under gravity to a first location on the bale support means said bale support including a movable conveyor moving in a direction tending to rotate the bale supported on said movable conveyor;

rotary bale grinding means mounted on the frame in position generally below the bale support means and positioned to engage a bale supported in the first location;

said bale support means including means on a lateral side of the bale grinding means and overlying the bale grinding means and inclining upwardly from a low point above the

axis of the bale grinding means for guiding and supporting a bale in position on the bale support means to have the periphery of such bale engaged by the bale grinding means, and

means on said frame adjacent said rotary bale grinding means providing a guide wall extending around and below



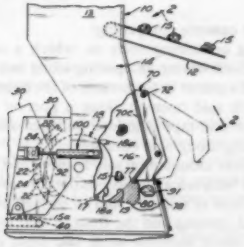
the rotary bale grinding means for guiding ground material ground by the bale grinding means to form a laterally facing outlet opening positioned below the level of the bale support means and extending along substantially the entire length of said bale grinding means to eject material laterally of the support frame in a direction generally perpendicular to the axis of the bale grinding means.

4,449,673

REDUCTION MILL

Wallace C. Cameron, San Pedro, Calif., assignor to Copper Alloys Corporation, Beverly Hills, Calif.

Filed Sep. 29, 1981, Ser. No. 306,758
Int. Cl.³ B02C *13/286*
U.S. Cl. 241—186 R **10 Claims**



1. In a reduction mill having a rotary hammer mill and an anvil wall in a mill cage zone, and a grate assembly structure, including grate components, pivotally displaceable with respect to said rotary hammer mill to provide access to both said grate assembly structure and said rotary hammer mill, and said grate assembly structure containing all of the said grate components for said reduction mill, including a product discharge section, the improvement which comprises:

a pivotally displaceable by-pass door for uncrushable materials, said by-pass door being displaceable from a position abutting the anvil wall of said reduction mill to an intermediate position adjacent a lower rear wall of said reduction mill to thereby expose an opening from said mill cage zone to a cavity means behind said anvil wall and thereby permit passage of uncrushable material from said mill cage zone to said cavity means without interrupting operation of said rotary hammer mill, said cavity means being angularly spaced from said grate assembly structure; and

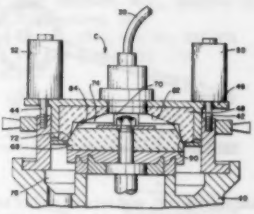
a common power means connected to each of said by-pass door and said grate assembly structure, each of said by-pass door and said grate assembly structure being selectively displaceable by said common power means to a position displaced from their normal operating positions in said reduction mill.

4,449,674

COMMINUTING APPARATUS WITH IMPROVED IMPELLER CONSTRUCTION

James J. Tloczynski, Parma, Ohio; Melvin Budzol, Schaumburg, Ill.; Clifford J. Abola, Cleveland, Ohio, and James C. Rine, Lake City, Fla., assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Oct. 29, 1981, Ser. No. 316,149
Int. Cl.³ B02C *7/11*
U.S. Cl. 241—245 **10 Claims**



1. A comminuting apparatus comprising:

a stator having a generally central abrasive surface defining a generally central region and a generally peripheral abrasive surface for defining a grinding zone;

a rotor which is rotatable relative to the stator, the rotor having a surface defining the generally central region spaced from and generally opposite the stator central abrasive surface both abrasive surfaces defining a receiving region between the central region and a generally peripheral abrasive surface on the rotor defining the grinding zone and disposed in a cooperative relationship with the stator peripheral abrasive surface; and

an impeller rotatably disposed in the receiving region, the impeller including a plurality of generally vertically disposed vanes which extend substantially from the rotor central region surface to the stator central region abrasive surface, such that the stator central region abrasive surface grinds the impeller vanes at a rate commensurate with the rate of wear between the rotor and stator peripheral abrasive surfaces, whereby a fluid seal is maintained between the impeller vanes and the stator central region abrasive surface to improve the impelling action.

4,449,675

FABRIC REWIND SYSTEM

John C. Parry, 6729 Brookmont Dr., Baltimore, Md. 21207

Filed Sep. 30, 1981, Ser. No. 306,944
Int. Cl.³ B65H *35/02, 17/08*
U.S. Cl. 242—56.2 **8 Claims**

1. In a fabric rewind device, having a fabric rewind means, and a fabric slitting capability, and an improved fabric rewind system, comprising:

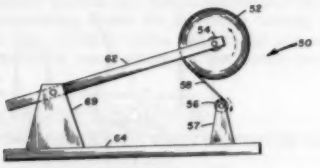
a structural frame means, said structural frame means consisting of a first support component, a second support component, and a base means, said first support component having a support member and a pivoted cantilever member, said first and second support components being suitably affixed to said base means;

a quantity of fabric, said quantity of fabric serving as a fabric supply, said fabric supply having width and length, said fabric supply having a first end and a second end, said first

and second ends being across said width, said length being considerably longer than said width;

a first core means, said first end of said fabric supply being suitably and removably affixed to said first core means, said length of said fabric supply being rolled upon said first core means in succeeding spiral-like layers to form a supply roll, said supply roll being suitably and removably supported by said pivoted cantilever member of said first support component of said structural frame means, said supply roll being located at the distal end of the longer arm of said pivoted cantilever member said pivoted cantilever member being in a substantially horizontal mode in relation to the vertical alignment of said support member;

a first second core means, said first second core means being positioned in said second support component directly under, longitudinally parallel with, and vertically in line



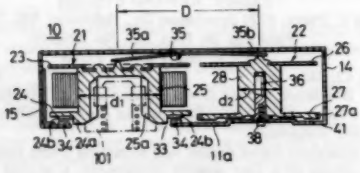
with said supply roll, said second end of said fabric supply being suitably and removably affixed to said first second core means, said length of said fabric supply being rewound upon said first second core means in succeeding spiral-like layers to form a rewind roll of said fabric, said fabric peeling from said supply roll as said fabric is rewound upon said first second core means, the direction of turning of said first second core means during the rewinding being counter to direction of turning of said supply roll as fabric is peeled therefrom, said rewinding being performed without any use of any intermediate rolls or idler means, said supply roll on said pivoted cantilever member resting upon and riding on said rewind roll and turning freely therewith from a position directly above said rewind roll as fabric is peeled from said supply roll and rewound upon said first second core means.

4,449,676

TAPE CASSETTE HAVING A REEL DISPLACEMENT LIMITING MECHANISM

Haruki Ogata, Sagamihara, and Hiroyuki Umeda, Yokohama, both of Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Jun. 22, 1982, Ser. No. 390,953
Claims priority, application Japan, Jun. 30, 1981, 56-97438[U]
Int. Cl.³ G03B *1/04*; G11B *15/32*
U.S. Cl. 242—198 **6 Claims**



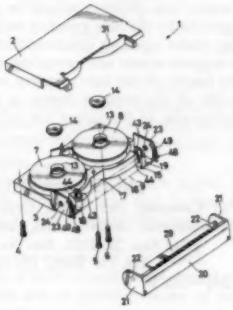
1. A tape cassette loaded with respect to a recording and/or reproducing apparatus having a reel driving mechanism including at least one reel driving shaft, said tape cassette comprising a cassette case, a reel provided within said cassette case, for winding a tape, and a reel displacement limiting mechanism for limiting displacement of said reel, said reel displacement limiting mechanism comprising: a first teeth part having crests and valleys, formed on the lower surface of said reel; a second teeth part having crests and valleys, formed on a bottom plate of said cassette case at a position opposing the first teeth part of said reel; urging means for urging said reel towards the bottom plate of said cassette case so that said first and second teeth parts mesh with each other; and displacement limiting means for limiting displacement of said reel along a radial direction thereof in a state where said first and second teeth parts are meshed to a quantity smaller than a displacement quantity of said reel along the radial direction thereof in a state where said reel is lifted against the urging force of said urging means and said mesh between said first and second teeth parts is released.

4,449,677

TAPE CASSETTE

Shuichi Ohta, Fujima, and Atsuhiro Kumagai, Yokohama, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jun. 22, 1982, Ser. No. 390,983
Claims priority, application Japan, Jun. 22, 1981, 56-96246
Int. Cl.³ G03B *1/04*; G11B *15/32, 23/04*
U.S. Cl. 242—199 **11 Claims**



1. A tape cassette comprising:

a housing containing reels on which a supply of tape is wound and having an opening along one side of the housing and a cutout in the bottom of the housing communicating with said opening along a portion of said opening, wherein said tape is guided between said reels in a path extending along said opening;

a front cover mounted on said housing and movable relative thereto between a closed position for covering said opening in front of said tape and an opened position for exposing said opening and the front of said tape; and

an inner cover movable with said front cover, said inner cover being positioned behind said tape to enclose said tape between said inner cover and said front cover when said front cover is in said closed position and the back of said tape being exposed when said front cover is in said opened position so that said tape can be engaged through said cutout for withdrawal of the tape through said opening.

4,449,678

PRESSURE BALANCE NONAXISYMMETRIC HIGH ASPECT RATIO AFTERBURNER CONVERGENT NOZZLE

Donald W. Hapke, Issaquah, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Sep. 29, 1981, Ser. No. 306,744
Int. Cl.³ F02K *1/06*; B64D *27/18*
U.S. Cl. 244—12.5 **22 Claims**

1. In a jet propulsion engine of the type adapted to be suspended from an airfoil's wing spar structure and having a jet

nozzle defining a minimal included angle θ between the wing chord reference plane and the trailing edge line-of-sight into the jet nozzle, an improved nonaxisymmetric high aspect ratio afterburner exhaust nozzle assembly comprising, in combination:

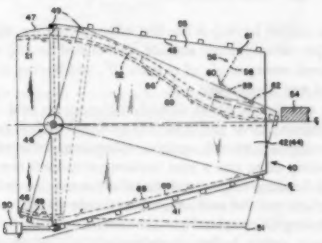
(a) a stationary nozzle casing fixedly mounted on the engine suspended from the airfoil's wing spar structure, said nozzle casing defining: (i) a stationary nozzle duct; and (ii), a rearwardly extending stationary duct member;

(b) said stationary nozzle duct defining a smooth, circumferentially continuous, frusto-spherical sealing surface;

(c) said rearwardly extending stationary duct member defining a smooth continuation of the upper portion of said smooth, circumferentially continuous, frusto-spherical sealing surface and forming a rearwardly extending stationary upper wall of said jet nozzle;

(d) a rotatable nozzle having a lower transverse floor, a pair of spaced upstanding nozzle sidewalls, and a transverse upper cover with the forward extremity of said rotatable nozzle being complementary in shape to, and dimensioned to fit snugly about, said smooth, circumferentially continuous, frusto-spherical sealing surface on said stationary nozzle duct;

(e) means for mounting said rotatable nozzle on said stationary nozzle duct with said rearwardly extending stationary duct member projecting rearwardly into and extending through said rotatable nozzle, and with said rotatable nozzle being free for rotational movement about a transverse axis passing through the forward end of said rotatable nozzle and said smooth, circumferentially continuous, frusto-spherical sealing surface on said stationary nozzle duct;



(f) a transversely extending foldable pressure bulkhead hingedly secured along its lower transverse edge to said rearwardly extending duct member adjacent the rear transverse edge thereof and hingedly secured along its upper transverse edge to said transverse upper cover on said rotatable nozzle;

(g) a first circumferentially continuous, non-deflecting wiping seal mounted on the forward extremity of said rotatable nozzle and in circumferentially continuous wiping sealing engagement with said smooth, circumferentially continuous, frusto-spherical sealing surface on said stationary nozzle duct;

(h) second non-deflecting wiping seals mounted adjacent the opposed lateral edges of said foldable pressure bulkhead and in wiping sealing engagement with said upstanding nozzle sidewalls;

(i) third non-deflecting seals mounted on the opposed longitudinal edges of said rearwardly extending stationary duct member in sealing relation with said upstanding nozzle sidewalls; said first, second and third non-deflecting seals being cooperable with the associated ones of said: (i) rotatable nozzle; (ii) stationary nozzle duct; (iii) stationary duct member; (iv) upstanding nozzle sidewalls; and (v), foldable pressure bulkhead so as to form a totally enclosed, sealed, variable volume, static pressure balance chamber in the space bounded by the upper surface of said rearwardly extending stationary duct member, the lower surface of said transverse upper cover, the inner surfaces of said spaced upstanding nozzle sidewalls, and the inner surface of said transversely extending foldable pressure bulkhead; and,

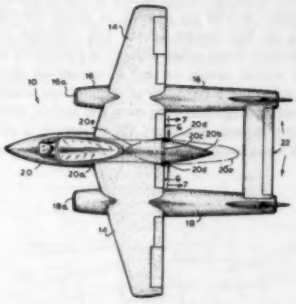
(j) means for rotating said rotatable nozzle about said transverse axis between: (i) a *cruise* position wherein said foldable pressure bulkhead is in its unfolded state and said bounding surfaces of said static pressure balance chamber define the maximum volume of enclosed space; and (ii), an *afterburn* position wherein said foldable pressure bulkhead is in its folded state and said bounding surfaces of said static pressure balance chamber define the minimum volume of enclosed space.

4,449,679

MULTI ROLE AIRCRAFT

Jean McComas, West Babylon, N.Y., assignor to Fairchild Industries, Inc., Germantown, Md.

Filed Mar. 5, 1982, Ser. No. 355,024
Int. Cl.³ B64C 1/22, 7/00
U.S. Cl. 244—118.2 **8 Claims**



1. An aircraft comprising a fuselage member, propulsion means for the aircraft disposed in a spaced relationship to said fuselage member, said fuselage member including a forward section and a separable aft section, said aft section being located in proximity to said aircraft's center of gravity, said aft section including a protruding portion, said protruding portion extending forward from said aft section, said protruding portion having a forward end portion containing discharge means in communication with the interior of said aft section for material contained within said aft section to be discharged from said aircraft through said forward end portion means whereby said aft section and said forward section are integrally connected to form a single fuselage member, said fuselage connecting means comprising complementary members extending between said forward section and said aft section in a substantially longitudinal direction, said complementary members being cooperatively engaged with one another, and latching means adapted to secure said forward section and said aft section in operative engagement.

4,449,680

AERODYNAMICALLY CONTOURED, LOW DRAG WING ENGINE AND ENGINE NACELLE COMBINATION

Louis B. Gratzer, Seattle, and Walter B. Gillette, Issaquah, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Continuation of Ser. No. 000,697, Jan. 3, 1979, abandoned. This application Dec. 22, 1980, Ser. No. 218,737
Int. Cl.³ B64C 1/38; B64D 29/02
U.S. Cl. 244—130 **15 Claims**

1. In an aircraft having a longitudinal axis and designed for flight at a predetermined design speed through a main airstream having a main flow direction, a combination of an

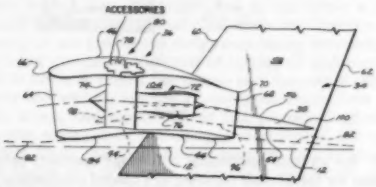
airfoil, engine and engine nacelle, said combination comprising:

a. an airfoil having a leading edge, a trailing edge, and an upper aerodynamic surface, said airfoil having a predetermined sweep angle of at least 10°, and having an outboard end and an inboard end;

b. a nacelle mounted near said airfoil at a location spaced above and forwardly of said airfoil, said nacelle having an upper nacelle surface and a lower nacelle surface, said lower nacelle surface comprising an inboard nacelle surface portion extending from a lower centerline of said lower surface in an inboard side line where said lower nacelle surface joins to said upper nacelle surface, and an outboard lower nacelle surface portion extending from said lower centerline to an outboard sideline where said lower nacelle surface joins to said upper nacelle surface, said lower nacelle surface being spaced upwardly and forwardly from said upper aerodynamic surface, said lower nacelle surface having a rear end positioned rearwardly of said leading edge and a forward end positioned forwardly of said leading edge;

c. an engine mounted in said nacelle;

d. said airfoil being characterized in that in a situation where the airfoil would be passing in flight through said airstream at the design speed, but without aerodynamic interference from other objects in proximity thereto, said airfoil would create in said airstream an airstream flow pattern having a plurality of streamlines which approach the leading edge and pass over the airfoil, with the airfoil creating in said airstream flow pattern a critical zone, which zone includes a general area in said airstream flow



proximate said airfoil, where at least one of the following conditions occur:

1. a local pressure coefficient in said airstream flow has an absolute magnitude greater than 0.05;

2. said airstream flow about said airfoil is supersonic

e. said nacelle having a critical surface region which comprises a one of the lower nacelle surface portions which is adjacent an airfoil portion that sweeps laterally and forwardly from the nacelle;

f. said nacelle having a critical contour area which comprises an area where any portion of the critical surface region is within said critical zone;

g. the critical contour area of the nacelle being in substantial contour alignment with the streamlines immediately adjacent the critical contour area to thereby reduce interference between said nacelle and said airfoil, which streamlines form a stream sheet, said critical contour area having a forward portion forward of the leading edge and sloping rearwardly in an upward direction slanted from said main flow direction in a direction of rearward sweep of said airfoil, said critical contour area having a rear portion rearward of said leading edge sloping rearwardly in a direction from said main flow direction oppositely to the direction of rearward sweep of the airfoil;

h. the upper nacelle surface and the lower nacelle surface portion which is not included in the critcal contour area being collectively a non-critical contour area, said non-critical contour area having at least a substantial portion thereof shaped to conform to configuration requirements of said engine, with at least part of the substantial portion of the non-critical contour area departing from substantial contour alignment with adjacent streamlines.

4,449,681

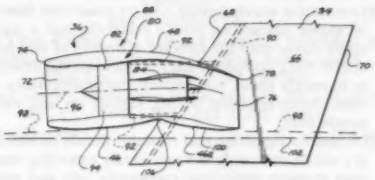
AERODYNAMICALLY CONTOURED, LOW DRAG WING, ENGINE AND ENGINE NACELLE COMBINATION

Louis B. Gratzer, Seattle, and Walter B. Gillette, Issaquah, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Continuation of Ser. No. 000,699, Jan. 3, 1979, abandoned. This application Dec. 22, 1980, Ser. No. 218,738

Int. Cl.³ B64C *1/38;* B64D *29/02*

U.S. Cl. 244—130 **15 Claims**



1. In an aircraft having a longitudinal axis and designed for flight at a predetermined design speed through a main airstream having a main flow direction, a combination of an airfoil, engine and engine nacelle, said combination comprising:

(a) an airfoil having a leading edge, a trailing edge, and an upper aerodynamic surface, said airfoil having a predetermined sweep angle of at least 10°, and having an outboard end and an inboard end,

(b) a nacelle mounted directly adjacent to said airfoil at a location above and forwardly of said airfoil, said nacelle having a forward section extending forwardly of the leading edge and a rear section positioned rearwardly of the leading edge, said nacelle having an inboard side surface portion and an outboard side surface portion,

(c) an engine mounted in said nacelle,

(d) said airfoil being characterized in that in a situation where the airfoil would be passing in flight through said airstream at the design speed, but without aerodynamic interference from other objects in proximity thereto, said airfoil would create in said airstream an airstream flow pattern having a plurality of streamlines which approach the leading edge and pass over the airfoil, with the airfoil creating in said airstream flow pattern a critical zone, which zone includes a general area in said airstream flow proximate said airfoil, where at least one of the following conditions occur:

1. a local pressure coefficient in said airstream flow has an absolute magnitude greater than 0.05,

2. said airstream flow about said airfoil is supersonic,

(e) said nacelle having a critical surface region which comprises a one of the nacelle side surface portions which is adjacent an airfoil portion that sweeps laterally and forwardly from the nacelle,

(f) said nacelle having a critical contour area which comprises an area where any portion of the critical surface region is within said critical zone,

(g) the critical contour area of the nacelle being in substantial contour alignment with the streamlines immediately adjacent the critical contour area to thereby reduce interference between said nacelle and said airfoil, which streamlines form a stream sheet, said critical contour area having a forward portion forward of the leading edge and sloping rearwardly in a direction slanted from said main flow direction in a direction of rearward sweep of said airfoil, said critical contour area having a rear portion rearward of said leading edge sloping rearwardly in a

direction from said main flow direction oppositely to the direction of rearward sweep of the airfoil,

(h) other nacelle surface portions which are not included in the critical contour area being collectively a non-critical contour area, said non-critical contour area having at least a substantial portion thereof shaped to conform to configuration requirements of said engine, with at least part of the substantial portion of the non-critical contour area departing from substantial contour alignment with adjacent streamlines.

4,449,682

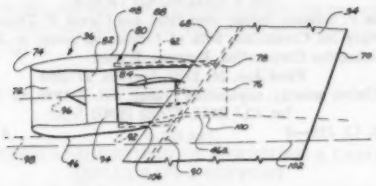
AERODYNAMICALLY CONTOURED, LOW DRAG WING, ENGINE AND ENGINE NACELLE COMBINATION

Louis B. Gratzer, Seattle, and Walter B. Gillette, Issaquah, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Continuation of Ser. No. 698, Jan. 3, 1979, abandoned. This application Dec. 22, 1980, Ser. No. 218,829

Int. Cl.[2] **B64D** *29/02*

U.S. Cl. 244—130 **14 Claims**



1. In an aircraft having a longitudinal axis and designed for flight at a predetermined design speed through a main airstream having a main flow direction, a combination of an airfoil, engine and engine nacelle, said combination comprising:

(a) an airfoil having a leading edge, a trailing edge, and a lower aerodynamic surface, said airfoil having a predetermined (weeep) sweep angle of at least 10°, and having an outboard end and an inboard end,

(b) a nacelle mounted directly adjacent to said airfoil at a location below and forwardly of said airfoil, said nacelle having a forward section extending forwardly of the leading edge and a rear section positioned rearwardly of the leading edge, said nacelle having an inboard side surface portion and an outboard side surface portion,

(c) an engine mounted in said nacelle,

(d) said airfoil being characterized in that in a situation where the airfoil would be passing in flight through said airstream at the design speed, but without aerodynamic interference from other objects in proximity thereto, said airfoil would create in said airstream an airstream flow pattern having a plurality of streamlines which approach the leading edge and pass under the airfoil, with the airfoil creating in said airstream flow pattern a critical zone, which zone includes a general area in said airstream flow proximate said airfoil, where at least one of the following conditions occur:

1. a local pressure coefficient in said airstream flow has an absolute magnitude greater than 0.05,

2. said airstream flow about said airfoil is supersonic,

(e) said nacelle having a critical surface region which comprises the nacelle side surface portions adjacent an airfoil portion that sweeps laterally and forwardly from the nacelle,

(f) said nacelle having a critical contour area which comprises an area where any portion of the critical surface region is within said critical zone,

(g) the critical contour area of the nacelle being in substantial contour alignment with the streamlines immediately adjacent the critical contour area to thereby reduce interference between said nacelle and said airfoil, which streamlines form a stream sheet, said critical contour area having a forward portion forward of the leading edge and sloping rearwardly in a direction slanted from said main flow direction in a direction of rearward sweep of said airfoil, said critical contour area having a rear portion rearward of said leading edge sloping rearwardly in a direction from said main flow direction also in the direction of rearward sweep of the airfoil,

(h) other nacelle surface portions which are not included in the critical contour area being collectively a non-critical contour area, said non-critical contour area having at least a substantial portion thereof shaped to conform to configuration requirements of said engine, with at least part of the substantial portion of the non-critical contour area departing from substantial contour alignment with adjacent streamlines.

4,449,683

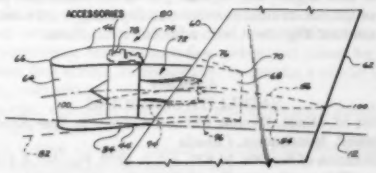
AERODYNAMICALLY CONTOURED, LOW DRAG WING ENGINE AND ENGINE NACELLE COMBINATION

Louis B. Gratzer, Seattle, and Walter B. Gillette, Issaquah, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Continuation of Ser. No. 000,754, Jan. 3, 1979, abandoned. This application Dec. 22, 1980, Ser. No. 218,847

Int. Cl.[3] **B64C** *1/38;* **B64D** *29/02*

U.S. Cl. 244—130 **14 Claims**



1. In an aircraft having a longitudinal axis and designed for flight at a predetermined design speed through a main airstream having a main flow direction, a combination of an airfoil, engine and engine nacelle, said combination comprising:

(a) an airfoil having a leading edge, a trailing edge, and an upper and a lower aerodynamic surface, said airfoil having a predetermined sweep angle of at least 10°, and having an outboard end and an inboard end,

(b) a nacelle mounted near said airfoil at a location spaced below and forwardly of said airfoil, said nacelle having an upper nacelle surface and a lower nacelle surface, said upper nacelle surface comprising an inboard nacelle surface portion extending from an upper center line of said upper surface to an inboard side line where said upper nacelle surface joins to said lower nacelle surface, and an outboard upper nacelle surface portion extending from said upper centerline to an outboard sideline where said upper nacelle surface joins to said lower nacelle surface, said upper nacelle surface being spaced downwardly and forwardly from said lower aerodynamic surface, said upper nacelle surface having a rear end positioned rearwardly of said leading edge and a forward end positioned forwardly of said leading edge,

(c) an engine mounted in said nacelle,

(d) said airfoil being characterized in that in a situation where the airfoil would be passing in flight through said airstream at the design speed, but without aerodynamic interference from other objects in proximity thereto, said airfoil would create in said airstream an airstream flow pattern having a plurality of streamlines which approach the leading edge and pass beneath the airfoil, with the airfoil creating in said airstream flow pattern a critical zone, which zone includes a general area in said airstream

flow proximate said airfoil, where at least one of the following conditions occur:

1. a local pressure coefficient in said airstream flow has an absolute magnitude greater than 0.05,
2. said airstream flow about said airfoil is supersonic,

(e) said nacelle having a critical surface region which comprises a one of said upper nacelle surface portions that is adjacent an airfoil portion that sweeps laterally and forwardly from the nacelle,

(f) said nacelle having a critical contour area which comprises an area where any portion of the critical surface region is within said critical zone,

(g) the critical contour area of the nacelle being in substantial contour alignment with the streamlines immediately adjacent the critical contour area to thereby reduce interference between said nacelle and said airfoil, which streamlines form a stream sheet, said critical contour area having a forward portion forward of the leading edge and sloping rearwardly in a direction slanted from said main flow direction in a direction of rearward sweep of said airfoil, said critical contour area having a rear portion rearward of said leading edge sloping rearwardly in a direction from said main flow direction also in the direction of rearward sweep of the airfoil,

(h) the lower nacelle surface and the upper nacelle surface portion which is not included in the critical contour area being collectively a non-critical contour area, said non-critical contour area having at least a substantial portion thereof shaped to conform to configuration requirements of said engine, with at least part of the substantial portion of the non-critical contour area departing from substantial contour alignment with adjacent streamlines.

4,449,684

SATELLITE SERVICING

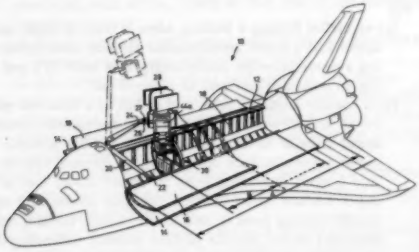
Charles M. Hinds, Weston, Canada, assignor to Spar Aerospace Limited, Mississauga, Canada

Continuation of Ser. No. 54,829, Jul. 3, 1979, Pat. No. 4,273,305. This application Jun. 2, 1981, Ser. No. 269,746

The portion of the term of this patent subsequent to Jun. 16, 1998, has been disclaimed.

Int. Cl.³ B64G *1/14*

U.S. Cl. 244—160 **2 Claims**



1. In a space shuttle orbiter having a cargo bay formed therein which has a longitudinal extent in a first direction extending from the crew compartment located at one end thereof, an improved payload distribution system comprising:

(a) a remote manipulator arm having a proximal end mounted in said cargo bay adjacent said one end thereof, said manipulator arm being operable to perform manipulating functions within a predetermined range along the longitudinal extent of the cargo bay,

(b) a plurality of mounting means located at intervals along said cargo bay within said operational range of said remote manipulator arm adapted to operably locate payload assemblies at a plurality of positions along the length of said cargo bay,

(c) a first primary payload assembly located in said cargo bay and releasably mounted on a first of said mounting means within the operational range of said manipulator arm at a convenient location along the length of said cargo bay to provide a free length of cargo bay at a position of opportunity along the length of said cargo bay,

(d) a secondary payload assembly disposed in said free length of said cargo bay within the operational range of said manipulator arm and releasably mounted on said mounting means, thereby to permit optimal utilization of said cargo bay, said secondary payload assembly comprising a replacement module support assembly which consists of a short generally planar support frame having a support face extending transversely of the cargo bay, said support face facing said one end of the cargo bay, and a plurality of replacement modules releasably mounted on said support face in a side-by-side generally planar array so as to be accessible to said manipulator arm and being adapted to be released by operation of said manipulator arm in use.

4,449,685

COUPLING FOR INDUCING A CURRENT IN THE RAILS OF A RAILROAD TRACK

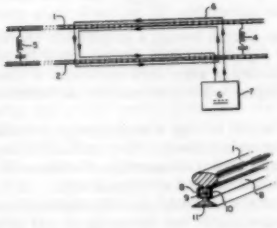
Jean P. Salmon, Aulnay sous Bois, and Claude P. Theze, Montigny les Cormeilles, both of France, assignors to Jeumont Schneider Corporation, Puteaux, France

Filed Jun. 26, 1981, Ser. No. 277,853

Claims priority, application France, Jul. 7, 1980, 80 15045

Int. Cl.³ B61L *27/00*; H04B *5/00*

U.S. Cl. 246—8 **6 Claims**



1. A coupling for inducing a high-frequency alternating current in the two rails of a railway, each of said rails having a cross section approximating the form of a mushroom, in which a lower end of a central vertical rib is flattened to form a horizontal flange, and characterized by the fact that said coupling comprises two conducting coils, each having a strip of conductive material attached to a strip of insulating material, the strips of conductive material having portions that are arranged in planes parallel to the sides of the central vertical rib of each rail and on opposite sides of each rib, with said strip of insulating material having portions separating the central vertical rib from corresponding portions of the strip of conductive material, the strips having width that is substantially greater than the thickness thereof, and the width of said portions being arranged vertically.

4,449,686

DISPLAY FIXTURE MOUNTING BRACKET

Melvin L. Kersey, Paragould, Ark., assignor to Darling Store Fixtures, Paragould, Ark.

Filed May 17, 1982, Ser. No. 378,918

Int. Cl.³ A47B *96/06*; A47G *55/00*

U.S. Cl. 248—215 **19 Claims**

1. A mounting bracket for a display fixture comprising:

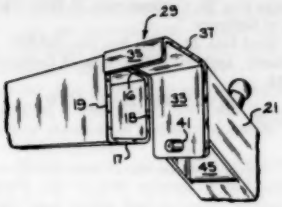
a hangrod positioned on said display fixture;

a hanger arm for mounting on said display fixture;

a mounting bracket positioned on one end of said hanger

arm, said bracket being disposed for engaging said hangrod to mount said hanger arm thereon;

a pin movably positioned in said mounting bracket, a first end of said pin extending from said bracket towards said hangrod, a second end of said pin extending from said bracket towards said hanger arm;



a flange disposed in said pin; and

a spring disposed for engaging said flange on said pin, said spring biasing said movable pin towards said hangrod whereby said first end of said pin engages said hangrod to maintain said bracket and hanger arm in position on said hangrod.

4,449,687

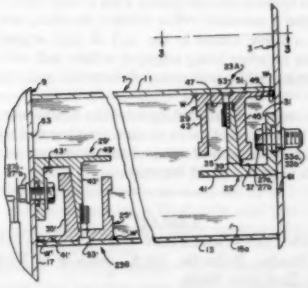
SYSTEM AND METHOD OF MOUNTING A LAMP HOLDER ON A SUPPORT

Vincent M. Karaktin, Nassau County, assignor to Emerson Electric Co., St. Louis, Mo.

Division of Ser. No. 136,435, Apr. 2, 1980, Pat. No. 4,317,164. This application Oct. 2, 1981, Ser. No. 308,047

Int. Cl.³ F16B *3/00*

U.S. Cl. 248—225.2 **4 Claims**



1. A system for mounting a member to a support, said system including a member, a support and a pair of mounting brackets, one mounting bracket mounted on the member and the other mounting bracket mounted on the support, said brackets being of a common extrusion, each of said brackets having a coupling flange, one of said pair of brackets being installed on said support with its coupling flange extending in one direction, the other of said pair of brackets being secured to said member with its coupling flange extending in another direction opposite said one direction, said coupling flanges being so arranged relative to one another so that upon said member and said support being brought into relative abutting relation, said coupling flanges are wedgingly engageable with one another as said member and said support are moved relative to one another in opposite directions so as to wedgingly draw and to hold said member in secure abutting relation on said support.

4,449,688

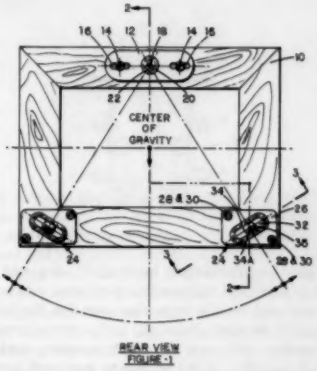
MEANS FOR CAUSING A SUSPENSIBLE PICTURE FRAME

Thomas S. Robins, 2151 Palomino Dr., Warrington, Pa. 18976

Continuation of Ser. No. 236,668, Feb. 23, 1981, abandoned. This application Apr. 11, 1983, Ser. No. 482,274

Int. Cl.³ A47G *1/16*

U.S. Cl. 248—498 **8 Claims**



REAR VIEW
FIGURE 1

1. For a first means, comprising a picture frame, a mirror, and the like, which is suspended from a substantially vertical second means, such as a door, a wall, and the like, means for interpositioning between such first and second means for causing said first means, automatically, to assume a plumb disposition, comprising:

a single, one-piece component which defines a rolling element retainer;

said rolling element retainer having means for holding a rolling element therewithin; and

a single rolling element held by said retainer; wherein

said rolling element comprises a ball, of a given diameter, rotatable about a plurality of axes;

said holding means of said retainer comprises means for accommodating rotation of said rolling element about a plurality of axes; and

said retainer comprises a substantially uniplanar plate, and a pair of substantially parallel members, joined to said plate, said plate and pair of members defining an elongate track of a given length; wherein

said rolling element makes only rolling point contacts with said pair of members, during rotation thereof; and

said given length of said track is greater in dimension than said given diameter of said ball and, as a consequence thereof, a portion of said track defines a void (a) open to said rolling element, and (b) along which said rolling element is free to displace from a first position thereof relative to said track to a second position thereof, relative to said track, which is spaced apart from said first position.

4,449,689

ADJUSTABLE HANGER FOR WALL-HUNG CABINETS AND THE LIKE

Karl Lautenschläger, Reinheim, and Gerd Viniol, Ober-Mossau, both of Fed. Rep. of Germany, assignors to Karl Lautenschläger KG, Möbelbeschlagfabrik, Reinheim, Fed. Rep. of Germany

Filed Jun. 24, 1981, Ser. No. 276,931

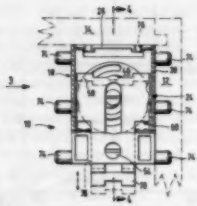
Claims priority, application Fed. Rep. of Germany, Jun. 25, 1980, 3023760; Oct. 1, 1980, 3036984

Int. Cl.³ F16M *13/00*

U.S. Cl. 248—544 **25 Claims**

1. A hanger for a wall-hung cabinet or the like, having: a casing adapted to be fastened in a rearward part of a cabinet

and a hook member adapted to be hung onto a wall hook or a wall-mounted rail, and displaceably disposed at right angles to a wall and also perpendicularly parallel to the wall, said casing being in the form of a substantially rectangular frame of relatively shallow depth and having a frame with frame elements disposed substantially vertically in their properly fastened position, a mounting part for mounting said hook member being mounted between said frame elements so as to be able to



swing about a substantially horizontally disposed axis and be locked at selectable intermediate positions, said hook member being disposed on the mounting part for displacement in a substantially vertical direction, and a cam disposed between the mounting part and the hook member, said cam being mounted rotatably at the mounting part and having a spiral groove in a flat side thereof facing the hook member, and a projection of the hook member engaging said groove.

4,449,690

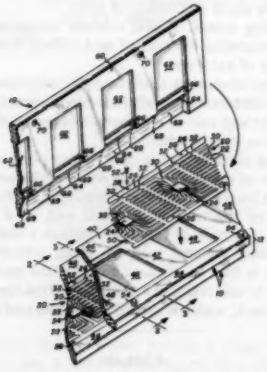
APPARATUS FOR ENCAPSULATION CASTING

Jon M. Schroeder, 10835 Morgan Territory Rd., Livermore, Calif. 94550, assignor to Jon M. Schroeder, Livermore, Calif.

Division of Ser. No. 224,658, Jan. 13, 1981, Pat. No. 4,374,080. This application Jul. 28, 1982, Ser. No. 402,714

Int. Cl.³ B28B *9/00*

U.S. Cl. 249—85 **6 Claims**



1. A unitary matrix element for cast encapsulation of an item comprising:

a first surface shaped and adapted to receive and secure an item to be encapsulated, the first surface being shaped to establish a portion of a molding cavity for enclosing an item to be encapsulated and a portion of an orifice surface extending from said molding cavity surface; and

a second surface located on an opposite side of the matrix element from the first surface, the second surface being shaped to mate with the first surface of another similar matrix element and to establish the remainder of said molding cavity surface and said orifice surface when two of such matrix elements are stacked together.

4,449,691

ELECTROMAGNET

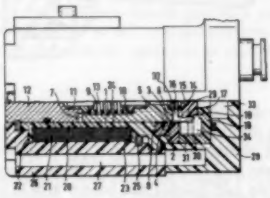
Egon Führer, 35, Hopfenstrasse; Dieter Kleinert, 9, Nelkenweg; Gerd Pfrogner, 20, Dresdener Strasse, all of D 8940 Memmingen, and Max Egg, 28, Gartenstrasse, D 8941 Erkheim, all of Fed. Rep. of Germany

Filed Dec. 21, 1981, Ser. No. 332,836

Claims priority, application Fed. Rep. of Germany, Aug. 17, 1981, 3132396

Int. Cl.³ F16K *25/00, 31/02*

U.S. Cl. 251—85 **7 Claims**



1. In an electromagnet comprising a core, a coil mounted on a coil body adjacent said core, an armature guide in said coil body and movable against said core in response to energization of said coil, and a spring for returning said armature on de-energization of said coil, the improvement comprising a buffer body of resilient material mounted on said coil body adjacent said armature, a recess in said buffer body having opposed end walls and an outwardly-extending annular flange on said armature and surrounding said armature projecting into said recess in the buffer body so that said flange is substantially fully enclosed within said buffer body and alternately abuts said opposed end walls of the recess to determine and dampen the stroke of the armature.

5. An electromagnet according to claim **1** wherein the electromagnet is operatively associated with a fluid valve having a valve seat and a movable valve closure member, and further comprising a valve recess in the end of said armature, said valve closure member being engaged within said valve recess so that it is operated by said armature between open and closed positions.

6. An electromagnet according to claim **5**, wherein a spring is provided between said valve closure member and said armature to resiliently urge said valve closure member axially outwardly with respect to said armature.

4,449,692

DRAIN CONSTRUCTION FOR A RADIATOR

Eugene E. Rhodes, Belleville, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Nov. 15, 1982, Ser. No. 441,337

Int. Cl.³ F16K *51/00, 5/00*

U.S. Cl. 251—144 **3 Claims**

1. A drain construction for a radiator which is characterized by:

a header for containing a fluid handled by the radiator, said header including a drain area having an inner surface facing into an interior fluid handling portion of said header and an outer surface facing outwardly from said drain area of said header;

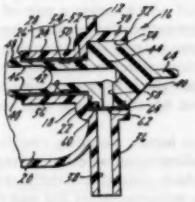
a first annular pipe extending from said inner facing surface of said drain area of said header to a free end thereof within said interior fluid handling portion of said header, said first annular pipe having an interior axially extending opening of a first fixed diameter extending therethrough from said outer surface of said drain area of said header to said free end of said first annular pipe;

a second annular pipe extending from said outer surface of said drain area of said header to a free end thereof above said outer surface of said header, said second annular pipe having an interior axially extending opening of a second fixed diameter extending therethrough from said outer surface of said drain area of said header to said free end of said second annular pipe, said opening of said first annular pipe and said second annular pipe being coaxial with one another with said second fixed diameter of said second annular pipe being larger than said first fixed diameter of said first annular pipe;

a third annular pipe intersecting said second annular pipe and providing a passageway from said opening of said second fixed diameter of said second annular pipe to the exterior of said header;

a plug received in part in said opening of said first annular pipe and in part in said opening of said second annular pipe, said plug having both a lower portion of circular cross section with a diameter slightly smaller than said first fixed diameter of said first annular pipe and an upper portion of circular cross section with a diameter slightly smaller than said second fixed diameter of said second annular pipe;

said lower portion of said plug having a bifurcated section at its free end with each of said bifurcations having a locking foot associated therewith, the length of said lower portion of said plug from said upper portion of said plug to said locking feet of said bifurcations being slightly greater than the length of said first annular pipe from said outer surface



of said header to said free end of said first annular pipe whereby said locking feet of said bifurcations are received over said free end of said first annular pipe to hold said plug in place;

a circumferential groove formed in an unbifurcated section of said lower portion of said plug;

an O-ring of resilient material received in said circumferential groove to provide a fluid tight seal between said unbifurcated section of said lower portion of said plug and said first annular pipe;

passageway defining means for forming a passageway through said lower portion and said upper portion of said plug whereby said interior fluid handling portion of said header may be interconnected with said third annular pipe when said portion of said passageway defining means located in said upper portion of said plug is aligned with said passageway of said third annular pipe;

a groove formed about an opening formed by said passageway defining means in said upper portion of said plug;

sealing means in said groove for providing a fluid tight seal between said opening formed by said passageway defining means in said upper portion of said plug and the surface of second fixed diameter of said second annular pipes; and

knob means on said upper portion of said plug for turning said plug between an open position in which said opening formed by said passageway defining means in said upper portion of said plug is aligned with said passageway of said third annular pipe and a closed position where said mentioned elements are not aligned.

4,449,693

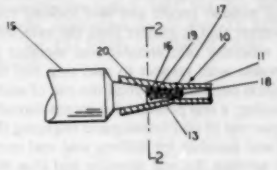
CATHETER CHECK VALVE

Gordon A. Gereg, 159 Sawpit Hill Rd., Woodbury, Conn. 06798

Filed Sep. 30, 1982, Ser. No. 428,886

Int. Cl.³ F16L *37/28*

U.S. Cl. 251—149.8 **7 Claims**



1. A check valve to govern fluid flow in tubing said tubing being resilient and elastic enough to be distorted by an axially tapered plug said plug being essentially oval in cross section at least at one end and having dimensions such that the major axis distorts the tubing into which the plug is installed into a flattened shape with a minor axis dimension considerable smaller than the tubing diameter so that a rigid tube or other device of slightly larger outer diameter than the tubings inner diameter when inserted into said resilient tube causes the resilient tubing to take the shape and size of the rigid tube at the minor axis of the plug thereby partially separating the resilient tubing from sealing contact with the tapered plug forming a passage for fluid flow past the tapered plug until the rigid tube is removed and the resilient tubing again returns to tight contact with the tapered plug thereby closing the flow passage.

4,449,694

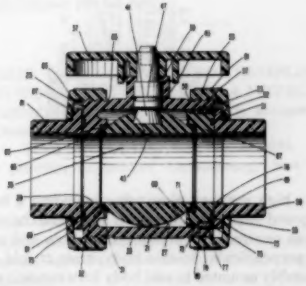
BLOCKED BALL VALVE

Ralph J. Hobart; Robert D. Rupp, both of Westerville, and Paul F. Mastro, Dublin, all of Ohio, assignors to Nibco, Inc., Elkhart, Ind.

Continuation of Ser. No. 205,403, Nov. 10, 1980, abandoned. This application Mar. 22, 1982, Ser. No. 360,236

Int. Cl.³ F16K *5/20*

U.S. Cl. 251—171 **1 Claim**



1. A valve having a housing, an axial passageway for fluids through said housing communicating between first and second ends thereof, a ball rotatably seated in and between the ends of said passageway for controlling the movement of fluid through the passageway, an annular seal member having an external diameter that is less than the internal diameter of said axial passageway whereby said annular seal member is axially slidably received in one end of said passageway said annular seal member having a ball engaging seal element on one end, said valve characterized in that said seal member has an external annular recess at its outer end forming an outwardly facing

shoulder, a locking ring threadedly mounted in said one end of said passageway and seated in said recess and engaging said shoulder to hold said annular seal member with the seal element in engagement with the ball and restrained against outward axial movement when the outer end of said locking ring is substantially flush with the end of the housing, said locking ring having an axial length that is less than the axial length of said external annular recess and said locking ring having an interior diameter that is greater than the exterior diameter of said recess whereby said annular seal member is axially inwardly movable with respect to said ring and the other end thereof projects outwardly beyond the end of said locking ring and said housing; a seal pressurizing means threadedly secured to the said one end of said housing and engaging the projecting end of said seal member for shifting said seal member toward said ball to increase the seal pressure and thus eliminate fluid leakage, a seat disposed on said housing at the face of said ball opposite from said one end of said ball for supporting said ball against axial movement under axial pressure exerted by said annular seal member, said seat comprising an annular compressible seal engaging said ball, said seal pressurizing means comprising a connecting sleeve flanged at one end, the flanged end seating against the projecting end of said annular seal member and an annular cap internally threaded to engage said one end of said housing and having an annular portion seated over said flanged end of said sleeve, first compressible seal means disposed between the projecting end of said annular seal member and said flange, and second compressible seal means disposed between at least one of said annular seal member and said locking ring, said annular seal member and an interior wall of said housing and said locking ring and an interior wall of said housing.

4,449,695

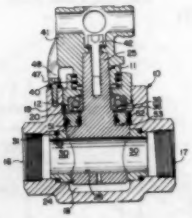
FIRE SAFE PLUG VALVE

William H. Alexander, and Roy R. Dare, both of Houston, Tex., assignors to Vapor Corporaion, Chicago, Ill.

Filed Aug. 19, 1982, Ser. No. 409,430

Int. Cl.³ F16K *31/44*

U.S. Cl. 251—214 **2 Claims**



1. In a high pressure plug valve including a hollow body with opposed inlet and outlet ports adapted to be connected to pipeline to control high pressure fluid flow and a bonnet extending perpendicular to said body, seats at said openings, a plug rotatably mounted in said body between said seats, a stem extending upward from said plug and bearingly received in the bonnet and extending out of the body for wrench engagement to rotate the plug between open and closed positions, and a packing plate above the plug and in the bonnet to seal between the body and the stem, the improvement in the packing plate which includes an annular metal ring with O-ring grooves opposite the respective surfaces of the body and stem to be sealed and on the plug side of the stem, resilient O-rings in each of said grooves, notches in the metal ring above each of the O-ring grooves, and nonresilient high temperature graphite ring seals along each of said notches directly backing up each of the O-rings, whereby the fluid under pressure in the valve body which leaks by the mating surfaces of the plug and seats causes the O-rings and ring seals to coact and seal between the metal ring and adjacent bonnet and stem surfaces.

4,449,696

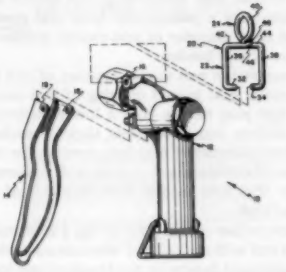
VALVE WITH HANDLE-MOUNTING RING

Robert W. Hengesbach, 7886 Mentor Rd., Mentor, Ohio 44060

Continuation-in-part of Ser. No. 313,456, Oct. 21, 1981, abandoned. This application Jun. 1, 1983, Ser. No. 499,822

Int. Cl.³ F16K *31/44*

U.S. Cl. 251—231 **3 Claims**



1. A handle-operated flow control valve, comprising:

(a) a valve body having valving means for controlling a flow of fluid through the body, and body portions an opposed slides thereof which define a pair of oppositely opening mounting formations that extend along a common axis;

(b) handle means for operating the valving means and having handle portions which extend closely alongside the body portions and which have mounting holes formed therethrough that coaxially align with the mounting formations; and,

(c) a one piece handle mounting ring formed from a single piece of resilient metal wire and having axially aligned end portions which extend coaxially with respect to and through the mounting holes and into the mounting formations to pivotally mount the handle means on the valve body for movement about the common axis, the mounting ring having a pair of support formations formed intermediate the end portions, the support formation defining first and second hook-engageable loops, with the first of the loops extending in a first plane which includes the common axis, with the second of the loops extending in a second plane that is substantially perpendicular to the first plane, and with the first and second loops being interconnected by a pair of curved transitional portions that are formed by twisting overlapping portions of the metal wire to form curved transitional portions that wrap snugly about each other to assist in inhibiting movement of the axially aligned end portions in directions relatively apart from each other.

4,449,697

MULTIPLE DRUM WINCHES

Raymond J. Hicks, Llandrindod Wells, Great Britain, assignor to Hicks Transmissions Limited, Powys, Great Britain

PCT No. PCT/GB81/00121, 371 Date Mar. 2, 1982, 102(e) Date Mar. 2, 1982, PCT Pub. No. WO82/00133, PCT Pub. Date Jan. 21, 1982

PCT Filed Jul. 2, 1981, Ser. No. 359,711

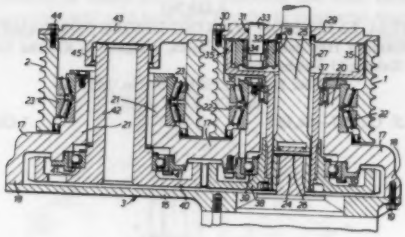
Claims priority, application United Kingdom, Jul. 3, 1980, 8021899

Int. Cl.³ B65D *1/74*

U.S. Cl. 254—297 **7 Claims**

1. A multiple drum winch comprising a base, two parallel drums carried side by side on the base for entrainment by a common cable, an input shaft, a sun gear on the input shaft

co-axial with the first drum, planet pinions carried by the first drum meshing with the sun gear, an internally toothed annulus



mounted co-axially with the first drum and meshing with the planet pinions, and a positive transmission between the second drum and said annulus.

4,449,698

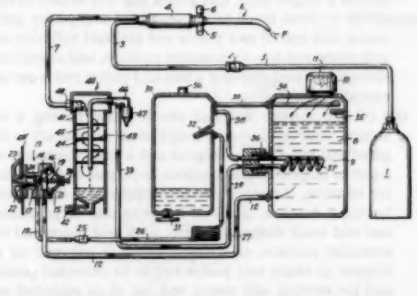
AUTOGENOUS PORTABLE WELDING APPARATUS

Rinaldi Renato, Modena, Italy, assignor to Uniox SRL Welding & Cutting, Bologna, Italy

Filed Mar. 31, 1983, Ser. No. 480,784

Int. Cl.³ B23K *7/00*

U.S. Cl. 266—48 **32 Claims**



1. Autogenous portable welding apparatus comprising a container for receiving a readily decomposable liquid capable of yielding a combustible gas; conversion means having an input thereof connected to said container for receiving the decomposable liquid and for effecting conversion at a rate which is a function of the rate of flow of the decomposable liquid thorough said conversion means; means for selectively releasing the combustible gas to a torch; conduit means for transmitting the increased pressures developed at the output of said conversion means during the conversion process to said container to increase the rate of flow of the decomposable liquid through said conversion means; and liquid flow control means disposed between said container and said conversion means for regulating the flow of the decomposable liquid through said conversion means as a function of the pressure in said container to thereby maintain a desired gas generation rate.

4,449,699

METHOD OF CONTROLLING AN OPERATION OF A COPY-CUTTING APPARATUS

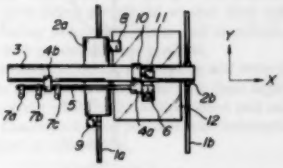
Takeshi Ashizawa, Tokyo, and Motoaki Yasumura, Kawagoe, both of Japan, assignors to Kabushiki Kaisha Tanaka Seisakusho, Tokyo, Japan

Division of Ser. No. 102,515, Dec. 11, 1979, Pat. No. 4,328,050. This application Sep. 9, 1981, Ser. No. 300,426

Claims priority, application Japan, Dec. 11, 1978, 53-152039

Int. Cl.³ B23K *7/10*; G05B *19/42*

U.S. Cl. 266—58 **10 Claims**



1. An apparatus for controlling an operation of a copying apparatus which includes a tracer for tracing a contour of a pattern to be copied and a working machine having a working head being movable in conjunction with the tracer in a given relationship for effecting a given working operation for an object to be worked comprising:

means for detecting coordinates of the tracer at operational points including at least a work start point, a copy start point and a copy end point;

means for storing the detected coordinates;

means for reading the stored coordinates out of the storing means;

means for setting a position of the tracer by means of the readout coordinates;

means for switching the copying apparatus between a position setting mode and a copying mode; and

means for controlling the above means in such a manner that during the actual working operation the movement of the tracer is controlled by the readout coordinates, while the switching means being in the position setting mode, whereas in the copying mode the movement of the working head is controlled by the movement of the tracer which follows the pattern.

4,449,700

METHOD AND APPARATUS FOR SAMPLING OR MEASURING A PARAMETER OF A METAL MELT

Jean Erpelding, Hautcharage, Luxembourg, assignor to Arbed S.A., Luxembourg, Luxembourg

Filed Nov. 22, 1982, Ser. No. 443,633

Claims priority, application Luxembourg, Nov. 26, 1981, 83789

Int. Cl.³ G01F *23/00*

U.S. Cl. 266—79 **8 Claims**

4. An apparatus for measuring temperature or sampling at a predetermined location below the surface of a molten metal melt comprising:

an upwardly open receptacle receiving said melt;

a probe adapted to be lowered into said melt to said location;

guide means above said receptacle forming a terminal path and including a carriage shiftable upwardly and downwardly along said path;

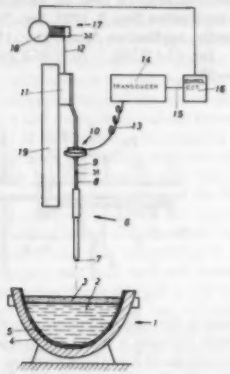
an electrically operated winch having a cable connected to said carriage for raising and lowering said probe;

a rod connecting said probe to said carriage and having upper and lower portions;

a contact detector responsive to retardation of said lower portion of said rod relative to the upper portion of said rod as said probe is lowered into contact with said surface for controlling said winch;

melt sampling means on said rod for measuring temperature or taking a sample at said location, said contact detector including a transducer generating an electric signal; and

circuit means between said transducer and said winch for halting said winch a predetermined time interval from the generation of the signal at said transducer on contact of



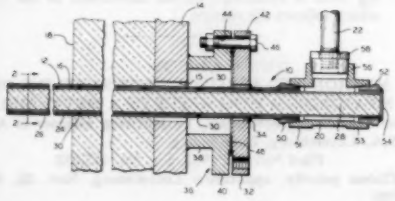
said probe on said surface, said contact detector also including a housing formed on said upper portion and provided internally with a membrane connected to said lower portion, said membrane subdividing said housing into a pair of compartments, one of said compartments being connected to said transducer.

4,449,701

TUYERE FOR THE INJECTION OF GASES INTO A METALLURGICAL VESSEL

Ken Pitzer, New Castle; James F. Cunningham, and Jai Pearce, both of Pittsburgh, all of Pa., assignors to Pennsylvania Engineering Corporation, Pittsburgh, Pa.

Filed Aug. 23, 1982, Ser. No. 410,312
Int. Cl.³ C21C *5/48*
U.S. Cl. 266—218 **7 Claims**



1. A tuyere for injecting a non-oxidizing gas into a metallurgical vessel comprising a first tuyere pipe,

means for fixing said first tuyere pipe to the wall of a metallurgical vessel with one end of said pipe extending inwardly into said vessel and the opposite end extending away from said wall,

a second tuyere pipe disposed within said first tuyere pipe and having an outer diameter less than the inner diameter of the first tuyere pipe,

first means for securing said second tuyere pipe against axial movement relative to said first tuyere pipe,

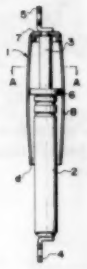
second means disposed between said pipes for maintaining the same in a spaced apart relation and to define a gap therebetween, gas inlet means coupled to said gap, and refractory material disposed within said inner tuyere pipe and filling the same whereby gas introduced at said gas inlet means flows through said gap and adjacent the walls of the first and second tuyere pipes for cooling the same as said gas is introduced into said vessel.

4,449,702

FULL EXTENSION LOCKING DEVICE FOR DAMPER

Mitsuhiro Hasegawa, Gifu, Japan, assignor to Kayaba Kogyo Kabushiki Kaisha, Japan

Filed Dec. 30, 1981, Ser. No. 335,672
Int. Cl.³ F16F *9/32*
U.S. Cl. 267—64.12 **7 Claims**



1. A damper comprising:

a cylinder defining a space and having a longitudinal axis;

a piston rod slidable in said space and lying on said longitudinal axis;

pressure means in said space for urging said piston rod into an extended position with respect to said cylinder, said piston rod having an end remote from said cylinder and a length between said end and said cylinder;

a sleeve shaped elastic cover connected to said piston rod end and extending over said piston rod; and

a stopper connected to said cylinder at an end of said cylinder into which said piston rod is slidable, said elastic cover having a length from said piston rod end to said cylinder which is about equal to the length of said piston rod between said end of said piston rod and said cylinder when said piston rod is in its extended position, said elastic cover sliding over said cylinder when said piston rod is out of its extended position;

one of said stopper and said elastic cover having a cross section transverse to said longitudinal axis which is elongated and has a large diameter and a small diameter, with a pair of large diameter sections and a pair of small diameter sections, the other of said stopper and elastic cover having a medium diameter between said large diameter and said small diameter so that, with said piston rod in its extended position, said elastic cover is engaged on said stopper to retain said piston rod in its extended position, and for moving said piston rod out of its extended position, said elastic cover is deformable to reduce the distance between said large diameter sections and increase the distance between said small diameter sections to permit said elastic cover to pass said stopper.

4,449,703

APPARATUS FOR BONDING MAIN ROTOR BLADES

Frank D. Robinson, Rancho Palos Verdes, Calif., assignor to Robinson Helicopter Company, Torrance, Calif.

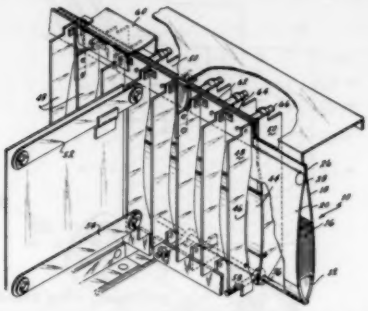
Continuation of Ser. No. 127,112, Mar. 4, 1980, abandoned, which is a division of Ser. No. 938,930, Sep. 1, 1978, Pat. No. 4,223,429. This application Aug. 6, 1982, Ser. No. 406,027
Int. Cl.³ B23Q *1/04*
U.S. Cl. 269—71 **4 Claims**

1. A fixture referenced to an XYZ orthogonal coordinate system for clamping the component parts of a rotor blade assembly during a bonding process, said rotor blade assembly

having a long axis, a leading edge and a trailing edge parallel to said long axis and skins extending between said leading edges, comprising:

a frame;

a plurality of clamp means for suporting said rotor blade assembly with said long axis initially in substantial alignment with the Y-axis, said leading and trailing edges being



substantially contained in the X-Y plane, and said clamp means exerting compressive force upon said assembly directed generally along said Z-axis;

means constraining said clamps against rotation about said Y-axis, each of said clamp means being mounted to said frame for movement along said X-axis in response to the warping of said rotor blade assembly during the bonding process.

4,449,704

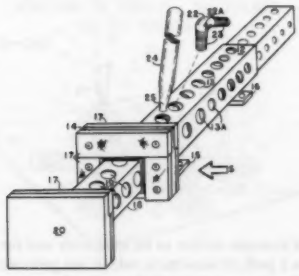
REVERSIBLE VERNIER VISES, CLAMPS, AND FORCE TOOLS

Victor H. Goulter, 485 Molimo Dr., San Francisco, Calif. 94127

Filed May 22, 1981, Ser. No. 266,500

Int. Cl.³ B25B *1/00*

U.S. Cl. 269—88 **17 Claims**



1. A force-applying tool, comprising:

first and second members, each having a plurality of separated passageways therealong, adjacent passageways in each of said members having a uniform spacing therebetween, the spacing between adjacent passageways of said first member being different from those of said second member, such that when said members are positioned adjacent each other in a first positional relationship such that their respective passageways are also adjacent each other, at least one pair of passageways of said respective members will be partially aligned to define a common passageway through both members, and at least one other pair of passageways will be substantially completely aligned to define another common passageway through both members,

means for forcing said members to move with respect to one another, said means comprising a free lever which can be inserted into said partially-aligned common passageways of said two members and then rotated about its points of contact with the edges of said partialy-aligned passageways to force said partially-aligned passageways into more complete alignment, thereby to cause said members to move with respect to each other to a new positional relationship, and

locking means for holding said members in said new relationship, whereupon said lever may be removed,

said first and second members each being fitted with a vise jaw, said vise jaws being positioned so that they can be brought into facing alignment when said members are moved axially to a predetermined position,

whereby said members can be moved rapidly and reversibly through a wide range of relative positions, then adjusted rapidly and securely with force multiplication and tactile feedback, and finally locked in position with substantially infinite resolution of adjustment.

4,449,705

PAPER FEED DEVICE

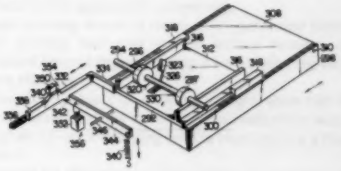
Kunihiro Shibuya, Yokohama, and Kohachi Uchida, Sagamihara, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Feb. 18, 1981, Ser. No. 236,283

Claims priority, application Japan, Feb. 18, 1980, 55-18694; Feb. 22, 1980, 55-21187; Feb. 22, 1980, 55-21188; Feb. 26, 1980, 55-22917; Feb. 29, 1980, 55-25081; Jun. 4, 1980, 55-75153; Jun. 4, 1980, 55-75154

Int. Cl.³ B65H *3/44*

U.S. Cl. 271—9 **11 Claims**



1. A paper feed device comprising:

(a) a paper feed cassette accommodating paper sheets;

(b) a paper feed mechanism for feeding paper from said paper feed cassette;

(c) a manual paper supply guide means provided on or near said paper feed cassette and movable between a position to permit cassette paper supply and a position to permit manual paper supply; and

(d) locking means for holding said manual paper supply guide means in said position to permit manual paper supply at the time of manual paper supply mode and for releasing said guide means from said manual paper supply position to automatically switch the manual paper supply mode to a cassette paper supply mode according to an externally coupled signal for bringing about the cassette supply mode.

4,449,706

DRIVE SYSTEM FOR A COLLATOR

Donald L. Snellman, 2807 W. Galer, Seattle, Wash. 98199, and Bernard A. Pearson, King County, Wash., assignors to Donald L. Snellman, Seattle, Wash.

Filed Jun. 29, 1981, Ser. No. 278,360

Int. Cl.³ B65H *29/58*

U.S. Cl. 271—290 **19 Claims**

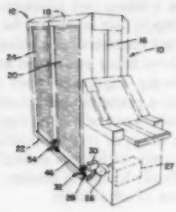
1. In a collator having sheet-feeding means, sheet-conveying

means, a row of trays forming a bin unit to receive collated sheets, and a deflector assembly to deflect sheets from the sheet-conveying means into the trays, the improvement to the drive system of the collator comprising:

(a) a direct current motor having a power output shaft;

(b) a drive shaft for powering components of the collator including at least one sprocket;

(c) means for coupling the output shaft of the motor to the drive shaft; and



(d) a power takeoff operatively associated with the sprocket of the drive shaft to power the components when the output shaft of the motor turns, the takeoff including a driven sprocket on a driven shaft and a three-dimensional endless belt to couple the sprocket of the drive shaft to the driven sprocket of the driven shaft; wherein the three-dimensional belt engages the sprocket of the drive shaft in a first plane and engages the driven sprocket in a plane substantially orthogonal to the first plane, without twisting of the belt.

4,449,707

GOLF CLUB HEAD OF CARBON FIBER REINFORCED PLASTIC

Keijiro Hayashi, Takatsuki; Toshimi Awano, Ohgaki; Masayuki Yoshikawa, Iwate; Kouzou Yazawa, Gifu, and Takashi Ito, Ohgaki, all of Japan, assignors to Mizuno Corporation, Osaka, Japan

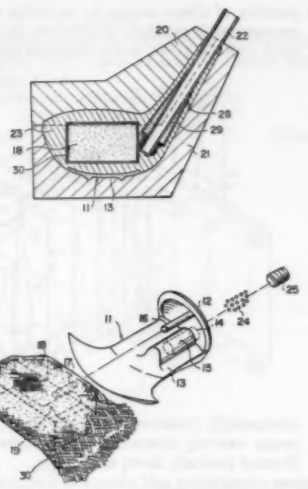
Filed May 20, 1983, Ser. No. 496,640

Claims priority, application Japan, May 22, 1982, 57-87137; Aug. 31, 1982, 57-152439

Int. Cl.³ A63B *53/06*

U.S. Cl. 273—171 **4 Claims**

1. A golf club head comprising a shell of carbon fiber reinforced plastic, a core embedded in the center portion of said shell to reduce the head weight, a reinforcement of carbon fiber fabric surrounding the core and extending into the neck portion of the head to strengthen the head and the neck portion, a metal sole member including integral side and sole portions so arranged as to cover the side and the bottom of said shell, respectively, at least one projection of said metal sole member inserted into said core to position and retain it in said shell, and pocket means in said metal sole member for containing weights to be used for adjustment of the head or balance adjustment.



4,449,708

GOLF PRACTICE DEVICE

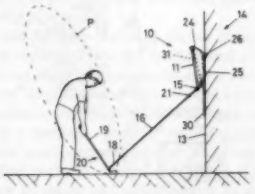
Michael N. R. Humphrey, 39 Princes Rd., Kingswood, S.A. 5062, Australia

Filed Aug. 18, 1982, Ser. No. 409,109

Claims priority, application Australia, Aug. 21, 1981, PF0375

Int. Cl.³ A63B *69/36*

U.S. Cl. 273—186 A **19 Claims**



1. A golf practice device to be used with and for guiding a golf club in a path of movement which lies generally in a first plane and deviates only slightly from that first plane, comprising a track, means for securing the track to a fixed stationary mounting surface, the track being smaller in dimension and similar in shape to the path of movement and lying generally in a second plane parallel to but spaced from the first plane;

a carriage movable along and guided by the track;

a flexible tension member;

first means for securing one end of the tension member to the carriage and having second securing means for securing the other end of the tension member to a shaft of the golf club, and

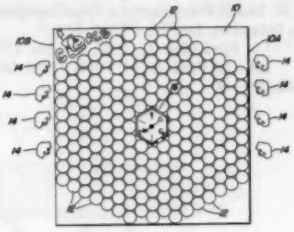
length adjustment means on the tension member by which the distance between a head of the golf club and the carriage is adjustable.

4,449,709

BOARD GAME HAVING MEANS FOR EJECTION OF PLAYING PIECES

Robert McKay, 221 N. Hemlock Rd., Wood Dale, Ill. 60191

Filed Jun. 1, 1982, Ser. No. 383,522
Int. Cl.³ A63F 3/00
U.S. Cl. 273—248 6 Claims



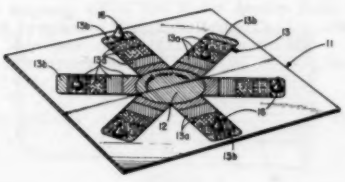
1. A board game comprising
a. a board having marked positions extending from at least two edges of the board to the center;
b. at least one master playing element which is flexible and hollow, said master element being adapted to receive and retain a secondary playing element;
c. at least one secondary playing element of a size adapted to fit within the master element;
d. a control device adapted to be placed in the center of the board and the marked positions; said control device including selection means for determining the number of marked positions which the elements may be moved and release means for ejecting the secondary playing elements from the master playing elements.

4,449,710

GAME BOARD, DIE AND REWARD DETERMINING GAME APPARATUS

Norman A. Davis, 2835 Rice St., Apt. 710, Minneapolis, Minn. 55113

Filed Jul. 28, 1980, Ser. No. 173,055
Int. Cl.³ A63F 3/00
U.S. Cl. 273—249 3 Claims



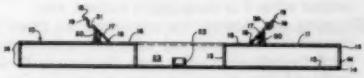
1. Game apparatus comprising,
a. a game board including
(1) a winner's circle
(2) a plurality of player ramps extending radially of said circle, each ramp having a plurality of color coded spaces with
(3) a starting space at the end of each ramp remote from the circle,
b. a playing piece for each player initially placed on the starting space of one of the ramps,
c. a playbook having a plurality of life situation problems set forth therein with a plurality of multiple choice responses to be selected by the player, and
d. a selection die having color coded surfaces thereon to provide the means for determining which of a plurality of different actions a player should take,
certain of said die colors corresponding to the colors of the ramp spaces,
at least one other die surface having a color which is different from the die colors corresponding to the ramp space colors,
when the die turns up the color on the next ramp space toward the winner's circle from the ramp space on which the player's playing piece resides, the player moves his piece onto said next ramp space,
when the die turns up said different color, the player is directed to answer a problem in the playbook, by means of which said player may make a "correct" response which entitles him to move his playing piece one space on the ramp toward the winner's circle,
each player reaching the winner's circle receiving a reward.

4,449,711

BOARD GAME SIMULATING BUSINESS PRINCIPLES INVOLVING PETROLEUM COMMODITIES

Danny L. Calloway, 3814-6 Chamberlayne, Richmond, Va. 23227

Filed Mar. 29, 1982, Ser. No. 363,039
Int. Cl.³ A63F 3/00
U.S. Cl. 273—256 1 Claim



1. A board game apparatus comprising:
(a) a rigid playing board of rectangular perimeter having an upper playing face and printed indicia thereon, and a depressed central region having a lower playing face and indicia thereon,
(b) status signs capable of standing upright upon said board and containing indicia denoting nationalization status,
(c) a first set of cards carrying indicia representing a business charter,
(d) a second set of cards carrying indicia representing insurance matters,
(e) a multidenominational set of token money,
(f) number-selecting means,
(g) playing pieces adapted to be moved by a player a number of playing spaces dictated by said number-selecting means,
(h) at least one spring activated catapult device mounted upon said playing board,
(i) a ball adapted to be thrown by said catapult device, and
(j) a cup centered in said depressed central region and adapted to catch said ball.

4,449,712

METHOD OF PLAYING A CESTABALL GAME WITH A SCOOP DEVICE

Joseph C. Benedyk, Highland Park, Ill.; Homer C. Amos, Palm Springs, Calif.; Carl E. Scheie, Libertyville, and William R. McGlone, Northfield, both of Ill., assignors to Brunswick Corporation, Skokie, Ill.

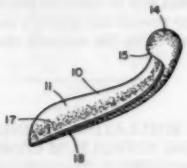
Continuation of Ser. No. 158,267, Jun. 10, 1980, abandoned.
This application May 13, 1982, Ser. No. 377,806
Int. Cl.³ A63B 59/02
U.S. Cl. 273—326 45 Claims

1. A method of playing a ball game comprising the steps of:
(A) providing a rectangular court having a floor and two pairs of oppositely facing walls, one pair of walls comprising side walls and being approximately 40 feet long and the other pair of walls comprising a front wall and a back

wall, each being about 20 feet long, the walls being at least 10 feet high;

(B) providing a ball having a weight ranging from 70 to 90 grams;

(C) providing at least one catching and throwing element comprising a scoop means having an inner and outer surface with a distal end and a proximal end, and a ball holding cup means having inner and outer surfaces with an open edge and a closed edge, the closed edge secured to the proximal end thereby defining a scoop-cup means, the scoop means having an elongated central first axis extending from the distal end to the proximal end, a portion of the scoop means along the first axis having a portion thereof in the configuration of a segment of a hyperbolic spiral, the spiral having a formula in which the polar coordinates RO equal a constant C ($R\theta=C$) and wherein the values of R range from 1.5 to 60 centimeters and the values of the constant C range from 10 to 30 centimeter-radians when θ is measured in radians; and,



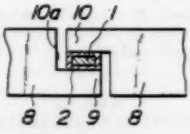
(D) using the element for attempting to throw the ball toward the front wall and using means for attempting to catch the ball rebounding from the front wall, side walls, or floor before the ball touches the floor twice and then immediately attempting to throw the ball toward the front wall so that the ball does not touch the floor before it strikes the front wall.

4,449,713

AQUEOUSLY-SWELLING WATER STOPPER AND A PROCESS OF STOPPING WATER THEREBY

Yoshinobu Ishido, and Hideo Tanaka, both of Fukuyama, Japan, assignors to Hayakawa Rubber Company Limited, Fukuyama, Japan

Division of Ser. No. 226,896, Jan. 21, 1981, Pat. No. 4,366,224.
This application Apr. 19, 1982, Ser. No. 369,624
Claims priority, application Japan, Oct. 17, 1980, 55-145358; Oct. 17, 1980, 55-145359
Int. Cl.³ E02D *29/16*
U.S. Cl. 277—1 **4 Claims**



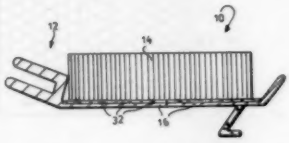
1. A process of stopping water at a gap in a building structure, comprising the steps of forming a water stopper by securing at least one layer of an aqueously-swelling water-stopping composition on an outer peripheral surface of an elongated core member with high tensile strength; and placing the water stopper in the gap of the building structure, whereby the water stopper swells by absorbing water from the outside thereof so as to fill up that portion of the gap where said water stopper is placed, wherein said aqueously-swelling water-stopping composition consists of 10 to 40 weight % of rubber whose main ingredient is reclaimed rubber blended with less than 30 weight % of virgin rubber, 10 to 20 weight % of a silicic compound selected from the group consisting of silicic acid anhydride, hydrous silicic acid and calcium silicate, 10 to 60 weight % of bentonite, and 10 to 40 weight % of plasticizer.

4,449,714

TURBINE ENGINE SEAL AND METHOD FOR REPAIR THEREOF

John W. Meier, West Hartford, Conn., assignor to Gulf & Western Industries, Inc., New York, N.Y.

Filed Mar. 22, 1983, Ser. No. 477,717
Int. Cl.³ F16J *15/44*; F01D *11/08*; B05D *1/08*
U.S. Cl. 277—9 **20 Claims**



12. A method for repairing a worn or damaged seal of a gas turbine engine, said seal including a backing plate having a backing wall and a honeycomb seal attached to said backing wall, comprising the steps of:

removing said honeycomb seal from said backing wall, thereby reducing the thickness of said backing wall;

low pressure plasma spraying the surface of said backing wall from which said honeycomb seal was removed, thereby restoring said backing wall to a desired thickness; and

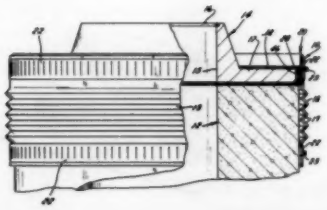
applying a new honeycomb seal to said sprayed surface of said backing wall.

4,449,715

EXTERNAL MANHOLE SEAL

Michael Gagas, 5558 N. Shoreland Ave., Whitefish Bay, Wis. 53217

Filed Aug. 19, 1982, Ser. No. 409,644
Int. Cl.³ F16J *15/10*; E02D *29/14*
U.S. Cl. 277—12 **8 Claims**



1. An external manhole sealing assembly comprising

a flexible sleeve for spanning the joint between a manhole frame having a radially extending flange and a manhole casing,

first means for forming a first seal between said sleeve and the flange of the manhole frame, said first means including

a U-shaped circular band adapted to be mounted on the flange and a vertical flange extending upwardly from the band to form a sealing surface for said sleeve, and

a compressible sealing strip located between the flange and the U-shaped band to seal the space between the band and the flange, and

second means for forming a second seal between said sleeve and the exterior of said manhole casing, thereby forming a

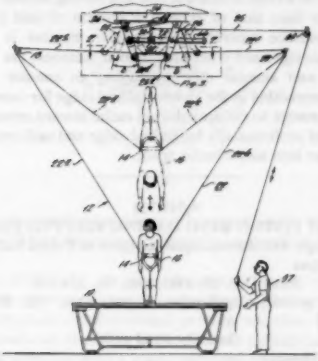
continuous seal about the joint between the frame and the casing.

4,449,716

TRAINING DEVICE FOR ATHLETES

Robert I. Goldy, 61 W. 62nd St., Apt. 17H, New York, N.Y. 10023, and R. Clyde Herrick, 1707 Penns La., Ambler, Pa. 19002

Filed Sep. 29, 1982, Ser. No. 426,656
Int. Cl.³ A63B 7/00
U.S. Cl. 272—109 **11 Claims**



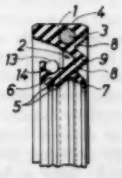
1. A training device for athletes for automatically taking up slack in and providing the braking force to the suspension line of a training rig, said device comprising a frame assembly, a pair of spaced arms, each of said arms rotatably mounted adjacent one end thereof to said frame assembly for angular motion in a common plane, means at the free end of each of said arms for receiving a portion of said suspension line and returning said portion toward said other arm biasing, means continuously acting on said arms tending to angularly separate the free ends of said arms, and braking means for selectively slowing or arresting the movement of said arms.

4,449,717

SEALING MECHANISM FOR BEARINGS

Michio Kitawaki, Kyoto, and Masao Annaka, Kobe, both of Japan, assignors to Mutsubishi Rubber Co., Ltd., Japan

Filed Oct. 21, 1982, Ser. No. 435,850
Claims priority, application Japan, Oct. 21, 1981, 56-167036; Oct. 21, 1981, 56-155363[U]
Int. Cl.³ F16J 15/32
U.S. Cl. 277—153 **11 Claims**



1. A sealing mechanism comprising a cylindrical housing adapted to concentrically surround an axially extending shaft and a bearing to which a lubricating oil is supplied to apply a lubricating effect to said shaft, and a pair of elastic oil seals ringedly interposed between said housing and said shaft adjacent to said bearing for preventing leakage of said lubricating oil from said bearing, each of said oil seal being characterized in that:

(a) an elastic prop ring is buried in and extends through a radially outer portion of said oil seal, said prop ring being partly cut out and thus providing a radially outwardly directed elasticity;

(b) one of annular side surfaces of said oil seal has a V-shaped annular groove which is cut out to a depth greater than half a width of said oil seal;

(c) the other annular side surface of said oil seal has a W-shaped annular groove which cooperates with said V-shaped groove to form a dog-legged portion integrally with said radially outer portion, said dog-legged portion improving an elasticity of said oil seal in a radial direction; and

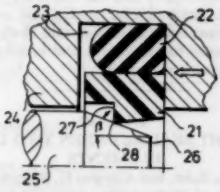
(d) a radially inner portion of said oil seal comprises an oil sealing lip formed integrally with said dog-legged portion.

4,449,718

PACKING FOR HYDRAULIC PISTONS OR PISTON RODS

Heinz K. Müller, Waiblingen, Fed. Rep. of Germany, assignor to Busak & Luyken, Fed. Rep. of Germany

Filed Jul. 6, 1983, Ser. No. 511,109
Claims priority, application Fed. Rep. of Germany, Jul. 10, 1982, 3225906
Int. Cl.³ F16J 15/32
U.S. Cl. 277—170 **3 Claims**

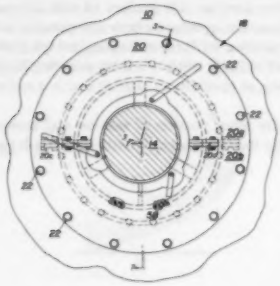


1. Packing for hydraulic pistons and piston rods with a packing ring comprised of a tough elastic synthetic material as a contact packing between a stationary machine part comprising an annular groove and a moving machine part comprising an initial slope and of a rubber clamping ring clamping the packing ring radially and providing a sealing action with respect to the annular groove in the stationary machine part, in which the peripheral surface of the packing ring adjacent the moving machine part as seen in the axial direction comprises a step in the region of its centre, the end face of which step is adjacent the high pressure side and starting from the step towards the low pressure side forms a conical surface opening with a small wedge angle, so that a sealing edge is located between the end face of the step and the conical surface, wherein located between the conical surface forming the wedge angle and the step is an annular surface which with the conical surface forms an obtuse angle of such a value that when the packing travels in over the initial slope located on the moving machine part, the resultant F_{res} of the contact normal force F_N and the frictional force F_R at least approximately halves the sealing edge angle.

4,449,719
EMERGENCY SEAL

Jon J. Radosay, Morton Grove, and John R. Wilson, Lisle, both of Ill., assignors to John Crane Houdaille, Inc., Morton Grove, Ill.

Filed Apr. 1, 1982, Ser. No. 364,522
Int. Cl.³ E21B *33/06*; F16J *9/00*
U.S. Cl. 277—192 **12 Claims**

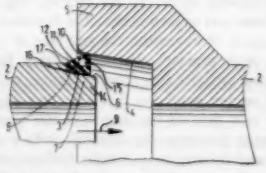


1. A seal for selectively sealing the annular space between a housing and a rotatable shaft, said seal comprising;
(a) an annular, split housing having two components adapted to be affixed about the shaft and to the housing;
(b) said housing having radially extending flanges to define an annular, radially extending compartment in which seal members may be mounted for radial movement;
(c) at least two seal members, each defining a sector or a circle mounted in said compartment, said seal members having a sealing means on their interior circumference for sealingly engaging the shaft; and gasket means for sealingly engaging one another and said compartment;
(d) bias means extending about said seal members for urging said members into contact with said shaft; and
(e) cam means carried by said seal members for engaging one another and, alternatively, caming said members against said bias means and away from said shaft, or, permitting said bias means to move said seal members into sealing engagement with said shaft.

4,449,720
WATERTIGHT SEAL BETWEEN TWO CONCRETE ELEMENTS

Tjako A. Wolters, Zeist, and Aloysius G. Roggekamp, Alphen an der Rijn, both of Netherlands, assignors to Ballast-Nedam Groep N.V., Amstelveen and Waco Beton B.V., Ijssel, both of, Netherlands

Filed Nov. 17, 1981, Ser. No. 322,178
Claims priority, application European Pat. Off., Jan. 8, 1981, 81200017.2
Int. Cl.³ F16J *15/32*
U.S. Cl. 277—207 A **5 Claims**

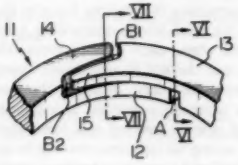


1. A seal for forming a watertight seal between two tubular members, one having a female portion receiving a male portion of the other in which the male and female portions define an annular space when the tubular members are axially shifted together such that said male portion is entered into said female portion, said male portion having a stepped end of reduced diameter which defines a shoulder, said annular space being defined between said male portion and an inwardly tapering surface of said female portion, said seal comprising an annular member of resilient material seated upon said stepped end of the male portion, said annular member having an inner face seated on said stepped end, a first side face seated against said shoulder, a second side face of greater width than said first side face and generally parallel to said shoulder, and an outer face sloping outwardly from said first side face to said second side face whereat a ridge is defined, said seal having an outer diameter greater than that of at least a portion of said inwardly tapering surface whereby said annular member is radially inwardly compressed when said tubular members are brought together, said annular member having an annular channel formed therewithin in the vicinity of said ridge for causing said annular member to collapse during radial inward compression thereof and preferentially bulge said ridge and said second end face deeper into said annular space.

4,449,721
SPLIT PISTON RING HAVING STEPPED ENDS

Kazuo Tsuge, Yokohama, Japan, assignor to Tokico Ltd., Kawasaki, Japan

Filed Dec. 15, 1981, Ser. No. 331,129
Claims priority, application Japan, Dec. 18, 1980, 55-182563[U]
Int. Cl.³ F16J *9/00*
U.S. Cl. 277—221 **2 Claims**



1. A piston ring comprising :
an annular member of resilient material surrounding a longitudinal axis; said annular member having opposing high pressure and low pressure sides bounded radially by opposing radially inner and outer surfaces; a radial slit dividing said high pressure and low pressure sides along an arc generally perpendicular said axis; a radially and circumferentially extending gap through said low pressure side communicating with said slit at one end of said arc so as to form from said low pressure side within said arc a circumferentially extending resilient lip, and from said low pressure side adjacent said arc, a circumferentially extending projection; said circumferentially and radially extending gap separating said lip and said projection; said lip having a radially outer face; said projection having a radially inner face confronting said radially outer face; said lip being located substantially radially inwardly of said projection; said annular member further having a straight through gap radially extending from said radially inner surface to said radially outer surface through said high pressure side communicating with said slit at the other end of said arc, whereby at least a portion of said radially outer face of said lip is pressed against said radially inner face of said projection when pressure is applied to said radially inner surface, said at least a portion of said radially outer face being pressed against said radially inner face even when the width of said radially and circumferentially

extending gap is substantially increased by wear of said ring.

4,449,722

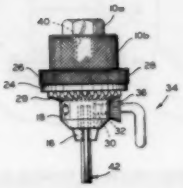
DRIVER FOR ALLEN HEAD SCREWS

Roy E. Knaggs, 10520 Whiteford Rd., Ottawa Lake, Mich. 49267

Continuation-in-part of Ser. No. 184,108, Sep. 4, 1980, abandoned. This application Jun. 14, 1982, Ser. No. 387,813

Int. Cl.³ B23B *5/22*

U.S. Cl. 279—62 **1 Claim**



1. A tool for Allen head screws, comprising:

(a) an elongate operating rod having a polygonal cross-section;

(b) a body having an external annular groove, the body section above said groove having a cylindrical portion and a polygonal cross-sectional portion adjacent its upper terminal end, the outer surface of said cylindrical portion being provided with a high coefficient of friction surface, an axial passageway extending through said body, said passageway being of uniform size throughout its entire length and adapted to receive said operating rod from either axial end of said passageway, and a plurality of channels converging on and opening into said passageway adjacent the lower terminal end thereof;

(c) clamping jaws slidably mounted in the channels of said body and having screw threads on the outer sides, said clamping jaws including flat surfaces on the inner clamping side of said clamping jaws for close abutting contact with said operating rod;

(d) a nut rotatably mounted in said groove and having a threaded connection with said jaws for shifting the same to a clamping or retracting position relative to said operating rod; and

(e) an operating ring surrounding said nut and internally secured thereto for actuating the same and having the outer surface of said ring provided with a high coefficient of friction surface whereby an operator may quickly position and clamp said body along the length of said operating rod, rotate said operating rod closely adjacent an associated Allen head screw and apply torque directly to said body obviating the loosening of the jaws clamping the operating rod to the body.

4,449,723

VEHICLE FUEL TANK

Kouji Shiratsuchi, Saitama, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 27, 1982, Ser. No. 372,321

Claims priority, application Japan, Apr. 28, 1981, 56-60630

Int. Cl.³ B60K *15/02*

U.S. Cl. 280—5 H **7 Claims**

1. A vehicle fuel tank comprising:

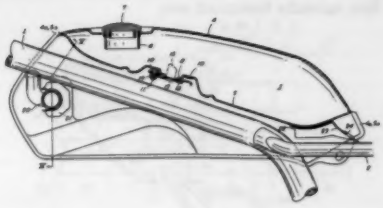
upper and lower fuel tank sections which are joined together to form said fuel tank, said lower fuel tank section comprising an upper wall and a pair of side walls so as to form an inverted U-shaped portion for straddling a vehicle frame;

a fuel inlet positioned within said upper fuel tank section;

an aperture provided in said upper wall of said lower fuel tank section;

a fuel level detector adapted to be inserted through said aperture into said fuel tank and mounted on said upper wall of said lower fuel tank section;

a base means connected to said fuel level detector and positioned so as to close said aperture;



means for fixedly mounting said base means on said lower fuel section; and

sealing means positioned around said aperture and between said base means and said lower fuel tank section for being held under pressure therebetween.

4,449,724

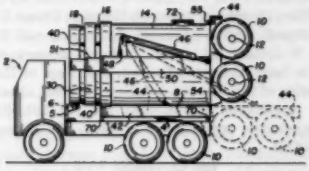
TELESCOPIC TANKER FOR CARRYING FLUID

Min H. Ahn, 5111 Maple Rd., Richmond, British Columbia, Canada

Filed May 7, 1982, Ser. No. 375,794

Int. Cl.³ B60P *3/22*

U.S. Cl. 280—5 C **15 Claims**



1. A tanker comprising:

a chassis;

wheels mounted on the chassis;

a first section to contain a fluid;

at least one other section able to telescope within the first section;

means to move the sections between a telescoped and an untelescoped position;

means to attach the tanker to a towing vehicle;

said chassis being extendible and comprising;

first members attached to the first section;

second members each able to telescope relative to a first member;

said wheels being mounted on the second members;

means to move the second members inwardly and outwardly relative to the first members.

4,449,725

SUPPORT FOR BOOMS AND OTHER FIELD EQUIPMENT

William G. Robison, deceased, late of Jackson, Minn., and by Luann Robison, executrix, Box 16, Alpha, Minn. 56111

Filed May 8, 1981, Ser. No. 261,917

Int. Cl.³ B60B *33/00*; **B62D** *61/00*

U.S. Cl. 280—78 **3 Claims**

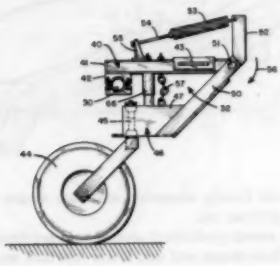
1. A wheeled support comprising, in combination:

a generally horizontal support platform having first and second ends;

securing means at said first end of said platform for fastening said platform to an object to be supported;

a bracket having a portion below and generally aligned with said platform;

means connecting said bracket to said second end of said platform for pivotal movement in opposite senses about a first, normally horizontal axis;



means resiliently opposing said pivotal movement in said first sense;

shock absorber means connected to said platform and said portion of said bracket and acting therebetween in a plane orthogonal to said first axis; and

a caster wheel carried by said bracket for swiveling movement about a second axis orthogonal said first axis.

4,449,726

CONTROL FOR FOLLOW-UP STEERING AXLES

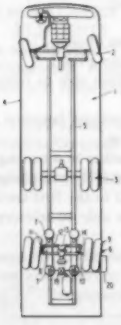
Paul Strifler, Dettingen; Heinrich Geissler; Dieter Lüdtke, both of Stuttgart; Rudolf Maurath, Esslingen, and Rudolf Steinecke, Weinstadt, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Continuation of Ser. No. 186,645, Sep. 12, 1980, abandoned. This application May 4, 1983, Ser. No. 491,451

Claims priority, application Fed. Rep. of Germany, Sep. 12, 1979, 2936766

Int. Cl.³ B62D *9/00*

U.S. Cl. 280—81 A **9 Claims**



1. A control arrangement for a follow-up steering axle of a motor vehicle, wherein means are provided for stabilizing the follow-up steering axle in a direction of a straight-ahead driving position in dependence upon a speed and a load of the motor vehicle,

the motor vehicle is at least a single-unit motor vehicle including at least three axles, and characterized in that

said means are capable of locking the follow-up steering axle in the straight-ahead driving position.

4,449,727

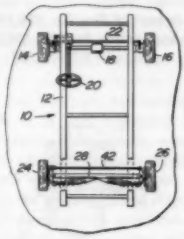
SKID CONTROL CAR

Bertil Roos, Box 221, Blakeslee, Pa. 18610

Filed Aug. 30, 1982, Ser. No. 412,756

Int. Cl.³ B62D *9/00*

U.S. Cl. 280—91 **12 Claims**



1. An automotive vehicle for training drivers in skid control wherein said vehicle has a set of front wheels, said front wheels being steerable, said rear wheels being pivotable and having a positive caster, said caster causing said rear wheels to steer away from the direction of a turn executed by the driver of the vehicle, said rear wheels being connected together by a transverse rod for causing the wheels to turn by the same amount, and wheel bias means to bias said rear wheels to a normally straight position.

4,449,728

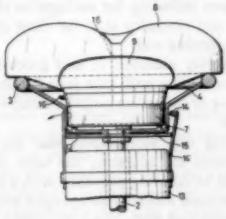
ANTI-CRASH APPARATUS FOR MOTORVEHICLES

Bernd Pilatzki, Franzstrasse 27, D-5000 Köln 41, Fed. Rep. of Germany

Filed Dec. 9, 1981, Ser. No. 328,859

Int. Cl.³ B60R *21/08*

U.S. Cl. 280—731 **9 Claims**



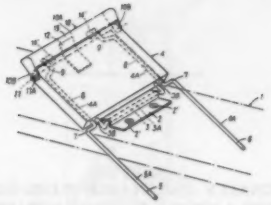
1. In an anticrash apparatus for motorvehicles with an airbag designed to be automatically inflated on deceleration of the vehicle being greater than a certain rate, the airbag being placed on the driver's side of a steering wheel shaft, which is at a slope of 10° to 60° to the horizontal, within the steering wheel and on the driver's side of a steering wheel spoke, the invention residing in that the airbag is so placed and designed that on inflation thereof, it takes up a position on the driver's side of a generally top third of the circumference of the steering wheel, its size measured in a direction normal to the plane of the steering wheel being less than 20 cm, a cushioning box is provided within the steering wheel for housing the folded-up airbag, and a part is provided which is fixed in relation to the rest of said vehicle and at least two linking parts for joining said cushioning box with said part, said linking part being designed to be moved by said steering wheel in such a way that at least one linking part is in its linking position all the time while an other linking part is moved back out of its linking position for letting past a spoke.

4,449,729

SKI BRAKE

Erwin Krob, and Helmut Bauer, both of Vienna, Austria, assignors to TMC Corporation, Baar, Switzerland

Filed Dec. 4, 1981, Ser. No. 327,392
Claims priority, application Austria, Dec. 12, 1980, 6049/80
Int. Cl.³ A63C 7/10
U.S. Cl. 280—605 14 Claims



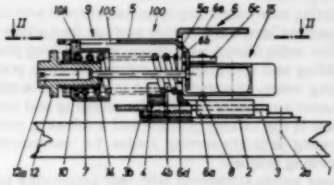
1. A ski brake mountable on a ski, comprising a base; a pedal supported on said base for pivotal movement about a transversely extending, substantially horizontal first axis between a braking position in which said pedal extends upwardly at an angle to the ski and a retracted position in which said pedal is adjacent and substantially parallel to an upper surface of the ski; first resilient means for yieldably urging said pedal toward said braking position; two elongate braking members supported on said pedal, each said braking member having a first section which is rotatably supported on said pedal and extends generally radially of said first axis, a second section which is parallel to and radially offset from said first section, and a third section which connects said first and second sections in the region of said first axis, rotation of said first section of each said braking member effecting movement of said second section thereof between a first position spaced laterally outwardly of a respective side wall of the ski and a second position located laterally inwardly of such side wall, each said braking member having at an end of said first section remote from said first axis means defining a crank, each said crank including a crank segment which is radially offset from and generally parallel to said first section of such braking member; a control part supported on said pedal at an end thereof remote from said first axis for pivotal movement relative to said pedal between third and fourth positions about a second axis which is substantially parallel to said first axis, said control part having means defining two laterally spaced guide slots in a surface thereof which faces said pedal, each said guide slot receiving said crank segment of a respective said crank therein and said guide slots, in response to pivotal movement of said control part, coacting with said cranks so as to effect rotation of said first sections of said braking members; and second resilient means for yieldably urging pivotal movement of said control part about said second axis in a direction toward said third position, said second resilient means being stronger than said first resilient means so that, in response to a downward force exerted on said control part by a ski boot, said control part will remain in said third position until said pedal has been moved from said braking position substantially to said retracted position and will thereafter move from said third position to said fourth position, thereby effecting rotation of said first sections of said braking members; and wherein said control part is generally U-shaped and includes a bight and two legs, said legs straddling said end of said pedal remote from said first axis and each having an opening therein, said pedal having means defining pins on opposite sides thereof which are coaxial with said second axis and received in respective said openings in said legs of said control part for effecting said pivotal support of said control part on said pedal, said guide slots being provided in said bight of said control part.

4,449,730

FRONT JAW FOR A SAFETY SKI BINDING

Gerhard Oberleitner, and Theodor Nitschko, both of Vienna, Austria, assignors to TMC Corporation, Baar, Switzerland

Filed Oct. 28, 1981, Ser. No. 315,814
Claims priority, application Austria, Nov. 4, 1980, 5410/80
Int. Cl.³ A63C 9/08
U.S. Cl. 280—625 14 Claims



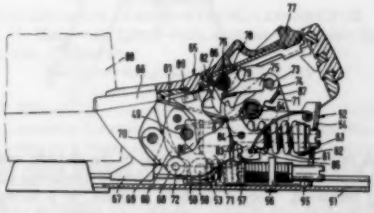
10. A safety ski binding jaw which is adapted to be mounted on a ski, comprising: a guide arrangement which can be secured to the ski; a support member which is supported on said guide arrangement for movement longitudinally of the ski; two sole holders supported on said support member for pivotal movement about respective, spaced, generally vertical axes, each said sole holder having first and second arms, said first arms being adapted to engage a ski boot and said second arms extending inwardly toward each other in directions generally transverse to the ski; resilient means cooperable with said sole holders for yieldably urging pivotal movement of each said sole holder in a first direction corresponding to movement of said second arm thereof in a direction toward the tip of the ski; and means on said support member for limiting pivotal movement of said sole holders in said first direction; said guide arrangement including a projection which engages said second arm of at least one said sole holder at a location thereon spaced from said pivot axis thereof.

4,449,731

HEEL HOLDER FOR SAFETY SKI BINDINGS

Walter Knabel, Murnau; Ludwig Wagner, Farchant, and Manfred Richert, Muechem, all of Fed. Rep. of Germany, assignors to Marker-Patentverwertungsgesellschaft mbH, Baar, Switzerland

Filed Jun. 24, 1982, Ser. No. 391,527
Claims priority, application Fed. Rep. of Germany, Feb. 19, 1982, 3206052
Int. Cl.³ A63C 9/08
U.S. Cl. 280—632 7 Claims



1. A heel holder for a safety ski binding, said ski binding having a toe holder for releasably holding the toe of a ski boot, said heel holder having a closed condition for retaining the heel of a ski boot and an open condition for releasing the heel of a ski boot, said heel holder comprising:

carriage means for supporting components of said heel

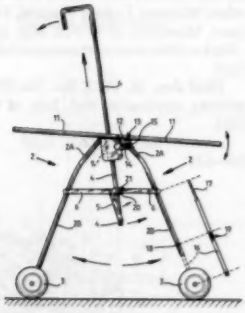
holder, said carriage means being movable between forward and rearward positions;
pressure spring means for biassing said carriage means toward the forward position;
a sole holder pivotally mounted on said carriage means for movement between a closed position for engaging a ski boot heel and an open position for releasing a ski boot heel;
opening spring means for biassing said sole holder to the open position;
connecting means movably connected to said sole holder for movement between a locking position for locking said sole holder in the closed position and an unlocking position for enabling said sole holder to assume the open position;
retaining means mounted on said sole holder for movement between a retaining position for retaining said connecting means in the locking position and a releasing position for releasing said connecting means for movement to the unlocking position;
attaching means connected with said connecting means for engaging said retaining means to hold said connecting means in the locking position when said retaining means is in the retaining position, and for disengaging said retaining means when said releasing means is in the releasing position to enable movement of said connecting means to the unlocking position; and
interim releasing means mounted on said carriage means, said interim releasing means moving said retaining means from the retaining position to the releasing position in response to movement of said carriage means from the rearward to the forward position upon release from a ski boot in the binding from the toe piece.

4,449,732

REVERSIBLE FOLDABLE PUSH-CHAIR FOR CHILDREN

Patrick Surot, Cholet, France, assignor to Ampafrance S.A., Castres, France

Filed Feb. 10, 1982, Ser. No. 347,607
Claims priority, application France, Feb. 13, 1981, 81 02878; Jun. 24, 1981, 81 12404
Int. Cl.³ B62B *7/06*
U.S. Cl. 280—644 **7 Claims**



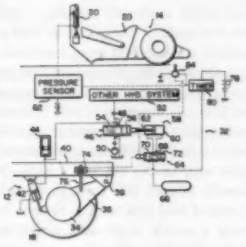
1. A reversible foldable push-chair of the slidable umbrella type adapted for folding; or when unfolded displaying either a facing rearward, "facing mother" position, or a facing forward, "look ahead" position, supporting a hammock and comprising on each side of the hammock,
a tipping core,
two wheel carrier branches hingedly mounted to said tipping core and having a wheel at one end of each of said branches,
a pushing arm slidably mounted and traversing said tipping core so that said pushing arm can slidably move through said tipping core and in a tipping motion in relation to the push-chair thereby rotating the position of said tipping core,
and link means connecting said pushing arm to said two wheel carrier branches
whereby dependent upon the direction of the tipping motion of the handle and of rotation of the position of said tipping core, the push-chair is spread out for displaying and locked in either a "facing mother" position or in a "look ahead" position.

4,449,733

ELEVATIONALLY ADJUSTABLE FLUID SUSPENSION SYSTEM FOR A WHEEL TRACTOR SCRAPER OR THE LIKE

Akio Iida, Kawasaki, and Osamu Kurihara, Yokohama, both of Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Dec. 22, 1981, Ser. No. 333,473
Claims priority, application Japan, Dec. 27, 1980, 55-185051
Int. Cl.³ B60G *11/26*
U.S. Cl. 280—707 **7 Claims**



1. An elevationally adjustable fluid suspension system for use in a vehicle, the vehicle having a vehicle frame, an axle connected to the vehicle frame for movement toward and away from the same, and a seperate fluid system the suspension system comprising:
(a) a source of fluid under pressure;
(b) a fluid suspension jack adapted to be operatively connected between the axle and the vehicle frame for varying the distance therebetween;
(c) a directional control valve for normally communicating the pressurized fluid source with said separate fluid system of the vehicle and, on actuation, selectively communicating the fluid suspension jack with the pressurized fluid source and with a fluid drain;
(d) an externally controllable timer means for producing a signal for a predetermined amount of time;
(e) means for actuating the timer means connected thereto;
(f) an elevation sensor means connected to the timer means and adapted to be operatively connected between the axle and the vehicle frame, said elevation sensor means being actuated by the signal from the timer means for putting out a signal representative of the elevation of the vehicle frame from the axle during the predetermined amount of time; and
(g) valve actuating means operatively connected to the directional control valve responsive to the output signal from the elevation sensor means for operating the directional control valve.

4,449,734

MECHANICAL LOCKING OUTRIGGER HYDRAULIC JACK FOR AN OUTRIGGER ASSEMBLY

William W. Cory, Clear Lake, Iowa, assignor to Hydra-Jack, Inc., Clear Lake, Iowa

Filed Jul. 7, 1982, Ser. No. 395,995
Int. Cl.³ B66C *23/78*; B60R *9/18*; B66F *3/24*
U.S. Cl. 280—766.1 **1 Claim**

1. In a crane including a housing, outrigger arms extendably and retractably mounted in said housing, an outrigger assembly comprising:

(a) A vertically disposed cylindrical locking sleeve, said sleeve being open at it lower end, a cap fixed to and closing the upper end of said sleeve, means for connecting said sleeve to an associated one of said outrigger arms, a valve block located within said sleeve at the upper end thereof, means for attaching said valve block to said cap;

(b) a first elongated vertically disposed cylindrical member fixed at it upper end to said valve block, said cylindrical member having an open lower end, first annular element fixed to and surrounding said lower end of said cylindrical member and projecting radially outwardly therefrom;

(c) a second elongated vertically disposed cylindrical member movably mounted in said sleeve, said second member having of a larger diameter than said first member and being concentrically disposed about said first member, means attached to the lower end of said second member for engaging a crane supporting surface, said second member having a closed lower end formed by said means for engaging a crane supporting surface, a second annular element fixed to the upper end of said second member and engageable with the external surface of said first member to form a fluid seal between said members, annular bearing means mounted at the upper end of said second member for engagement with the internal surface of said locking sleeve;

(d) a variable extension chamber defined by the interior volume of said first member and the interior volume of said second member that is located below said first annular element, a variable retraction chamber defined by the annular volume between said members located above said first annular element;

(e) means in said valve block for directing pressurized fluid to a a selected one of said chambers for extending or retracting said second member relative to said sleeve, said fluid direction means including a first orifice, conduit means extending from said orifice through the major portions of the length of said first member to said retracting chamber, passage means with an orifice in communication relationship with said extension chamber;

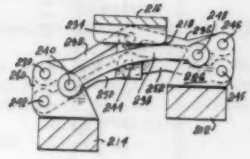
(f) said second member including threads on the external surface throughout the major portion of its length, said threads being located radially inwardly of said bearing means, a lock nut threadedly engaging said threads and movable longitudinally along said second member to a position to engage the lower end of said locking sleeve to support said second member in an extended position.

4,449,735

SKIING APPARATUS

David A. McDougall, C. P. 5, Ste-Agathe. Quebec, Canada

Filed Aug. 28, 1981, Ser. No. 297,313
Int. Cl.³ A63C *5/00*
U.S. Cl. 280—818 **1 Claim**



1. A skiing apparatus comprising at least two longitudinal co-extensive runners, each runner having control edges, a platform provided between the runners and extending parallel thereto, at least a quadrilateral linkage arrangement between each runner and said platform, each quadrilateral linkage arrangement including a plurality of link members pivotally connected to the runners with their respective pivoting axes extending longitudinally of the ski apparatus and parallel thereto such that any tilting movement applied to the platform will result in translatory movement of the runners in relative intersecting arcs whereby there is always at least two control edges adapted to contact the skiing surface, wherein the linkage arrangements include at least a pair of parallel link member extending between the outer extremity of one runner and the platform and forming a parallelogram therewith, a further pair of link members extending between the other runner and the platform and pivotally connected at the outer extremity of the runner and at the platform forming a parallelogram therewith, and a further link member extending between the runner and being curved in an arc facing away from the runners and the platform including a support surface adapted to bear on the arc-shaped link member such that as the linkage arrangement is tilted, the fulcrum point of the platform is shifted towards the uphill runner.

4,449,736

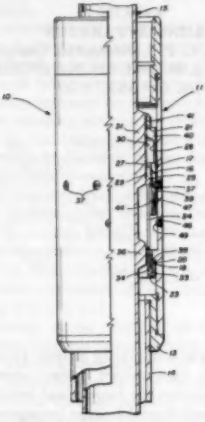
RELEASABLE TUBING STRING CONNECTOR

Henry W. Blackwell, Venus, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Dec. 16, 1981, Ser. No. 331,415
Int. Cl.³ F16L *37/08*
U.S. Cl. 285—3 **7 Claims**

1. A connector for releasably latching an upper section of a tubing string to a lower section including a tubular housing, a retaining sleeve mounted within said housing, said sleeve having an inner surface with an annular recess formed therein, a shear pin connected between said housing and said retaining sleeve and supporting said sleeve in a locking position, catch means on said housing and said sleeve for acting between said housing and said sleeve to support said sleeve in a release position within said housing spaced from said locking position, a latching member telescoped within said retaining sleeve including an upwardly facing shoulder formed at one end thereof, a corresponding downwardly facing shoulder formed in said housing and connected to abutting said upwardly facing shoulder to support said latching member against being pulled

upwardly out of said housing, said latching member further including a plurality of spring biased elements extending radially inward therefrom, a stinger telescoped into said housing and including a latch section disposed within said latching member and mated with said elements with said inner surface of said retaining sleeve blocking said elements against radial movement out of engagement with said stinger when said



sleeve is in its locking position, a bearing shoulder on said stinger engagable with said retaining sleeve to shift said sleeve downwardly and shear said pin when setting down on said tubing string to thereby shift said retaining sleeve into its release position with said elements being free to move radially out of said mating engagement with said stinger into said annular recess when said retaining sleeve is in its release position to enable said stinger to be pulled out of said housing.

4,449,737

HOSE COUPLER LOCKING ARRANGEMENT

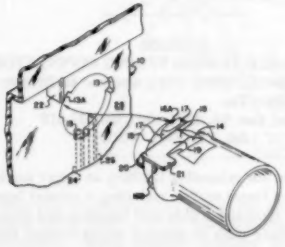
Glenn E. Specht, Massillon, Ohio, assignor to The Hoover Company, North Canton, Ohio

Filed May 7, 1982, Ser. No. 376,221

Claims priority, application United Kingdom, Apr. 21, 1982, 8211534

Int. Cl.³ A47L *9/24*; F16L *35/00, 5/00*

U.S. Cl. 285—7 **3 Claims**



1. A coupling arrangement including;
(a) a female coupling part,
(b) a male coupling part,
(c) said male coupling part disposed in said female coupling part,
(d) one of said coupling parts being rotatable to uncouple said male and female coupling parts, and
(e) one of said coupling parts extending axially and including a cantilevered, deformable straight finger formed integral with it to project transversely from said one of said coupling parts, said straight, transversely extending finger engaging an abutment fixed relative to the other of said coupling parts to prevent said relative rotation between said coupling parts, said finger being deformable away from said abutment to allow relative rotation of said coupling parts.

4,449,738

ROTARY FLUID COUPLING

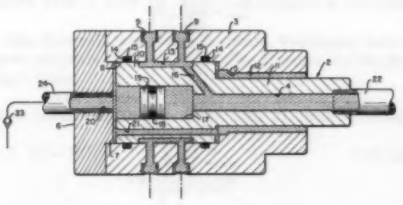
Karl Hotger, Bochum, Fed. Rep. of Germany, assignor to Gebr. Eickhoff, Maschinenfabrik und Eisengiesserei, m.b.H., Bochum, Fed. Rep. of Germany

Filed Dec. 18, 1980, Ser. No. 217,618

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1979, 2952272

Int. Cl.³ F16L *17/00*

U.S. Cl. 285—11 **4 Claims**



1. A rotary fluid coupling for interconnecting a liquid-conveying duct in a shaft element to a duct in a hub element, at least one of said elements being rotatable relative to the other, said fluid coupling comprising a bore in said hub element which receives said shaft element, said bore and said shaft element having cooperating large diameter portions communicating with smaller diameter portions, the large diameter portion of the bore terminating at one end in an end wall and at its other end in a shoulder which separates the large and small diameter portions of the bore, said end wall and shoulder limiting axial movement of said shaft element within said hub element, an axial passageway extending through the shaft element and adapted to be connected at one end to a source of fluid under high pressure and at its other end to a high-viscosity sealing material, and piston means in the axial passageway to separate the fluid under high pressure from said sealing material, an annular groove in the periphery of said large diameter shaft portion, radial passageway means connecting high pressure fluid in said passageway to said annular groove in the periphery of said large diameter shaft portion, and means connecting the high-viscosity sealing material in said passageway to both ends of said large diameter shaft portion to prevent the escape of fluid from said annular groove.

4,449,739

ROTARY COUPLING

Roger Raether, Ortonville, Minn., assignor to Hi-Tec, Inc., Milbank, S. Dak.

Continuation-in-part of Ser. No. 139,293, Apr. 11, 1980, abandoned. This application Mar. 31, 1982, Ser. No. 364,189

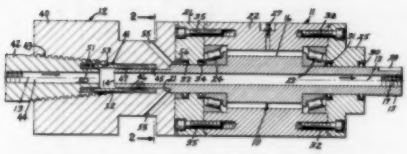
Int. Cl.³ F16L *27/00*

U.S. Cl. 285—14 **7 Claims**

1. A rotary coupler for conducting high pressure fluid from a stationary source to a rotatable utilization device, said coupler comprising:
a hollow rotatable shaft having a first upstream end in fluid communication with said source and a second downstream end in fluid communication with said utilization device, said shaft having an enlarged portion with a first axial length;
first and second roller bearings on opposite sides of said

enlarged portion from one another, said first and second bearings having first and second widths;

first means for housing said first and second bearings, said first housing means including a cylindrical wall and a pair of end caps, said cylindrical wall fitting closely in a radial dimension about said first and second bearings, said cylindrical wall having a second axial length shorter than a total distance of the first axial length of said enlarged portion and the first and second widths of said first and second bearings, each of said first and second bearings extending before compression a short distance axially beyond said cylindrical wall, said first housing means including means for fastening said end caps to said cylindrical wall to axially compress said bearings against said enlarged portion of said shaft when said end caps are fastened to said cylindrical wall, said first housing means



including low pressure packing means for sealing said bearings from low pressure fluids and debris;

second means for housing the first upstream end of said shaft, said second housing means being attached to said first housing means, said stationary source being in fluid communication with said second housing means allowing said fluid to flow from said stationary source to said rotatable utilization device through said second housing means and said hollow shaft;

high pressure packing means, within said second housing means, for sealing between the first end of said shaft and said second housing means;

whereby said first housing means provides steady support for said shaft allowing said high pressure packing means to seal between said shaft and said second housing means with respect to said high pressure fluid.

4,449,740

PRESSURE HOSE

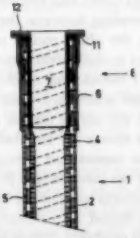
Günther Buzzi, Schiltach, Fed. Rep. of Germany, assignor to Hans Grohe GmbH & Co., Fed. Rep. of Germany

Filed Mar. 3, 1982, Ser. No. 354,304

Claims priority, application Fed. Rep. of Germany, Mar. 12, 1981, 3109359

Int. Cl.³ F16L *39/02*

U.S. Cl. 285—149 **5 Claims**



1. A pressure hose comprising:

an inner hose;

an outer hose;

a reinforcing helix arranged between the outer hose and the inner hose;

a plurality of axially directed reinforcing threads; disposed along the inner hose and,

at least one connecting nipple having concentric inner and outer sleeves of substantially circular cross-section, and between which sleeves is clamped one end of the pressure hose;

the inner hose and the reinforcing threads at end being longer than the outer hose and the reinforcing helix, the end of the inner hose and the reinforcing threads projecting beyond the reinforcing helix and the outer hose, said end of the inner hose and the reinforcing threads being wrapped around about 180° over the reinforcing helix and the outer hose, and clamped between said concentric sleeves.

4,449,741

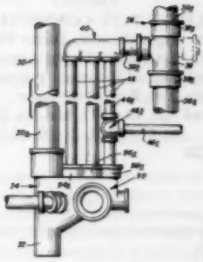
WASTE PLUMBING INSTALLATION AND FITTINGS THEREFOR

Robert L. Litvin, 180 E. Pearson St., Chicago, Ill. 60611, and David W. Price, 8749 S. Kenneth Ave., Hometown, Ill. 60456

Filed Mar. 31, 1981, Ser. No. 249,627

Int. Cl.³ F16L *41/00*

U.S. Cl. 285—153 **1 Claim**



1. In a waste plumbing installation, for use upon each of respective dwelling stories in a multiple storied building that is equipped with both a vertical plumbing waste stack and a separate vertical plumbing vent stack, said waste stack and vent stack being laterally spaced, and each story of the building being provided with a unitary waste plumbing manifold into which multiple waste lines, from plumbing fixtures on the story, discharge for transfer and discharge into the waste stack;

the improvement comprising, in combination: said unitary waste plumbing manifold being shaped and arranged to provide a vertical waste pipe segment which serves as part of the waste stack and a laterally elongated waste manifold section projecting laterally of the waste pipe segment, said manifold section including a horizontal shelf with a plurality of laterally aligned, and laterally spaced, vent outlet openings therethrough, each vent outlet opening being surrounded by a horizontal seat, with each vent outlet opening and seat being surrounded by a sleeve that extends upwardly of said shelf, the uppermost extent of said sleeves being located in a common plane spaced below the upper end of the waste pipe segment portion of the waste plumbing manifold;

each story of the building also being provided with a laterally elongated, unitary, vent manifold that connects at one end thereof to the vent stack that is laterally spaced from the plumbing waste stack and which projects laterally from its connection to the vent stack to a location spaced vertically above said laterally elongated manifold section of the waste plumbing manifold;

said elongated vent manifold providing therein a plurality of laterally aligned, female threaded, downwardly facing, vent inlets, in numbers, and lateral spacing between pair of inlets, equal to the number and spacing of lateral vent outlet openings in the manifold section vertically therebe-

low, and said threaded, vent inlets being located in the same plane;

and a plurality of vertical vent pipe means, each of equal effective length extending between the plurality of the vent outlets and plurality of vent inlets, each vent pipe means being threaded at its upper end into one of the female threaded vent inlets of the vent manifold, to be supported from said vent manifold, and each vent pipe means being of an effective length to have its lower end telescope into one of said seat-surrounding sleeves of the waste manifold section that is located vertically below the vent manifold;

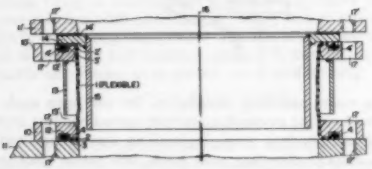
said seats in the waste manifold that surround the plurality of vent outlet openings therein being of a size adapted to be engaged by the lower ends of the multiple vent pipe means to provide initial support for said plurality of vent pipe means before each of said vent pipe means is screw-threadedly secured to and supported from the vent manifold thereabove, and with the lower end of each vent pipe means, that is supported by the vent manifold, being spaced above the seat therefor in the waste manifold, but being positioned with the corresponding surrounding sleeve.

4,449,742

FLEXIBLE SLEEVE TYPE CONNECTING STRUCTURE

Ludger Toerner, Eppertshausen; Dieter Garvens, Pfungstadt; Günter Hager, Untersteinach, and Anton Rettinger, Frankfurt, all of Fed. Rep. of Germany, assignors to Carl Schenck AG, Darmstadt, Fed. Rep. of Germany

Filed Apr. 29, 1982, Ser. No. 373,219
Int. Cl.³ F16L *21/00, 11/00*
U.S. Cl. 285—236 **12 Claims**



1. A flexible sleeve type connecting and sealing device having a longitudinal central axis for enclosing in a sealing manner a passage between a movable member and a stationary member, comprising a first flexible bellows type sleeve portion, a second flange portion extending substantially radially outwardly from each end of said first portion, and a third bulging ring portion near the circumference of each of said flange portions, said first, second and third portions being made of a three layer material including a webbing which has a high tear resistance and which is sandwiched between an inner silicone layer adhesively bonded by a silicone type adhesive bond to said webbing and an outer silicone coating on said webbing also adhesively bonded to said webbing by a silicone type adhesive bond, said three layer material merging integrally from said first cylindrical portion into said second flange portions, said webbing having threads extending at an angle of about 45° relative to said longitudinal central axis in said first portion for an improved flexibility, especially in the axial direction, said sandwiched three layer material having a high heat resistance and a high resistance to rupture as a result of sudden pressure increases inside the sealing device.

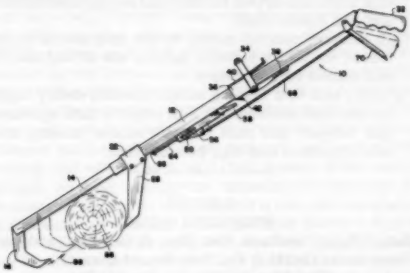
12. The use of a flexible sleeve type connecting and sealing device having a longitudinal central axis comprising a first flexible bellows type sleeve portion, a second flange portion extending substantially radially outwardly from each end of said first bellows type sleeve portion, and a third bulging ring portion near the circumference of each of said flange portions, said first, second and third portions being made of a three layer material including a webbing which has a high tear resistance and which is sandwiched between an inner silicone layer adhesively bonded by a silicone type adhesive bond to said webbing and an outer silicone coating on said webbing also adhesively bonded to said webbing by a silicone type adhesive bond, said three layer material merging integrally from said first cylindrical portion into said second flange portions, said webbing having threads extending at an angle of about 45° relative to said longitudinal central axis in said first bellows type portion for an improved flexibility, especially in the axial direction, said sandwiched three layer material having a high heat resistance to temperatures up to about 200° C., said sandwiched three layer material having a high resistance to rupture as a result of sudden pressure increases up to about 10 bar gage pressure inside said sealing device, for sealing and enclosing in an explosion proof manner a passage between a movable weigh hopper of a scale and a stationary member.

4,449,743

LOG HANDLING TOOL

Orlando K. Pankratz, 833 N. Vancouver, Tulsa, Okla. 74127

Filed Nov. 2, 1981, Ser. No. 317,137
Int. Cl.³ A47J *49/00;* **B66C** *1/42*
U.S. Cl. 294—11 **7 Claims**



1. A log handling tool comprising barrel means, shaft means reciprocally disposed within said barrel means, tine means secured to the outer end of the shaft means, prong means secured to the barrel means for cooperation with the tine means to retrieve and carry and release a log, pawl means and ratchet means cooperating between the shaft means and barrel means for securing the shaft means in selected longitudinal position with respect to the barrel means, latch means cooperating with the pawl means and ratchet means for providing movement of the shaft means in at least one longitudinal direction with respect to the barrel means, and handle means provided on said barrel means for facilitating handling of the log engaged by the tine means and prong means, spring means operably secured to the pawl means for constantly urging the pawl means in a direction toward the ratchet means, said latch means being spring urged in a direction toward the ratchet means, trigger means operably connected with the latch means for selective actuation thereof, and wherein the handle means comprises a first handle member secured to one end of the barrel means, and a second handle means secured to the barrel means substantially centrally between the opposite ends thereof for providing an efficient balance of the tool when a log is engaged by the tine means and prong means.

4,449,744

CARRYING OR HOLDING DEVICE FOR AT LEAST ONE CUP OR THE LIKE VESSEL AS WELL AS A BLANK THEREFORE

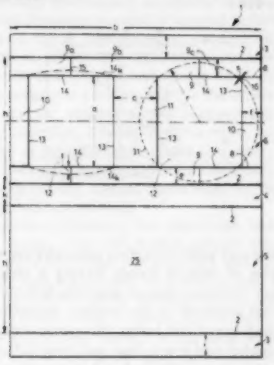
Franz Vossen, Stockach, Fed. Rep. of Germany, assignor to Meurer Non Food Product GmbH, Radolfzell, Fed. Rep. of Germany

Filed Jul. 29, 1981, Ser. No. 288,025

Claims priority, application Fed. Rep. of Germany, Jul. 31, 1980, 3029047

Int. Cl.³ B65D *71/00, 85/62*

U.S. Cl. 294—87.2 **8 Claims**



1. A carrying or holding device for a cup having a cantilever ring edge, said device comprising a flat sheet of material having a pair of spaced fold lines centrally located in said sheet to form a middle strip and two plate regions of equal size extending on opposite sides of said strip, each of said plate regions including a respective edge strip foldably connected to the remainder of the associated plate region remote from said middle strip, said edge strips having a width in relation to said middle strip such that with said plate regions folded about said fold lines into juxtaposed position and said strips overlapped and secured a rectangular shaped case is formed, one of said plate regions being plain, the other being provided with a cut out and adjoining frame edges respectively foldably connected to said middle strip and the edge strip associated with said other plate region, said frame edges each being provided with a straight transverse cut extending to said cut-out and being foldable inwardly towards said plain plate region upon insertion of a cup with a cantilever ring edge thereon to form respective triangular shaped edge portions for said case which rip the inserted cup and which form free edges on said edge portions which hold the cantilever ring edge of the cup.

4,449,745

TOGGLE ACTION JAW-TYPE GRIPPER

Leland F. Blatt, P.O. Box 220, Fraser, Mich. 48026

Filed Feb. 16, 1982, Ser. No. 348,945

Int. Cl.³ B66C *1/42*

U.S. Cl. 294—88 **6 Claims**

1. A toggle action jaw-type gripper comprising:

a hollow jaw body including an apertured mount flange at one end adapted for connection to an actuating unit having a projecting reciprocal rod end, and a pair of parallel spaced opposed side plates; there being opposed undercut guide slots formed upon the interior of said side plates longitudinally thereof;

an apertured clevis within said body slidably mounted and supported within said guide slots for reciprocal movements, and adapted for connection to said rod end;

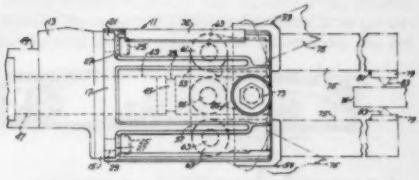
a pair of opposed jaw spacers of L-shape, each jaw spacer having spaced apertured trunions at one end and a central apertured pivot arm at its other end;

the trunions of one jaw spacer being assembled over and receiving the pivot arm of the other jaw spacer;

a pivot bolt supportably extending through said assembled trunions and pivot arm extending transversely through and spanning said side plates and secured thereto, providing a pivot mounting for said jaw spacers;

the respective other jaw arm and trunions of said jaw spacers extending rearwardly of said pivot bolt and spaced from said clevis;

first link at one end pivotally connected to said clevis upon a first transverse axis, and at its other end pivotally connected to the trunions of one of said jaw spacers upon a second transverse axis;



a second link at its one end pivotally connected to said clevis along said first axis, and at its other end pivotally connected to the pivot arm of the other jaw spacer upon a third transverse axis;

a jaw link mounted upon each jaw spacer intermediate its ends;

and a pair of opposed spaced jaw arms at their one ends extending into said body, selectively nested within said jaw links respectively at a preselected included angle and welded thereto; the other ends of said jaw arms when brought together on movement of said clevis in one direction adapted to retainingly secure a workpiece therebetween.

4,449,746

MOBILE COMPUTERIZED TOMOGRAPHY UNIT

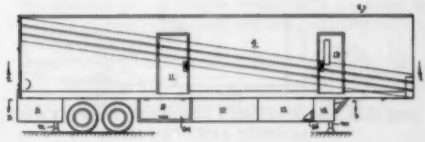
Ronald G. Clark, Gainesville, Fla., assignor to Synergetics, Inc., Gainesville, Fla.

Continuation of Ser. No. 826,527, Aug. 22, 1977, Pat. No. 4,181,347. This application May 9, 1979, Ser. No. 37,264

The portion of the term of this patent subsequent to Aug. 1, 1995, has been disclaimed.

Int. Cl.³ B62D *39/00*; B60P *3/00, 3/32*

U.S. Cl. 296—1 R **5 Claims**



1. A mobile computerized tomography unit comprising:

a vehicle trailer;

a CT-scanner gantry and patient table;

means for mounting the CT-scanner gantry and patient table as a unit and to prevent shock vibration from being transmitted to the CT-scanner gantry and patient table during travel of the mobile unit;

a mini-computer system for display and data processing of the CT-scanner mounted in the trailer;

means for mounting the mini-computer components to prevent shock vibration from being transmitted to each mini-computer component;

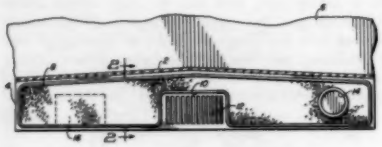
means for rigidly supporting the unit when the van is stationary.

4,449,747

INSULATING DASHBOARD COVER HAVING ANTIGLARE AND HEAT RESISTANT CHARACTERISTICS

Martin B. Morgan, 2609 W. Southern, Sp. 309, Tempe, Ariz. 85282; Marvin C. Morgan, 3232 E. Coronado, Phoenix, Ariz. 85008, and John W. Linde, 11611 N. 50 Ave., Glendale, Ariz. 85304

Filed Aug. 18, 1981, Ser. No. 294,010
Int. Cl.³ B60J *3/00*
U.S. Cl. 296—97 E **6 Claims**



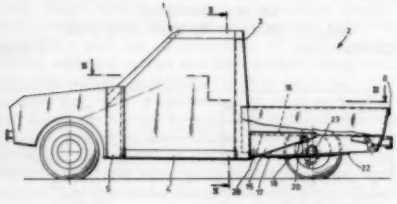
1. A method of covering a dashboard, comprising:
placing a layer of foil on the exterior surface of a vehicle windshield;
contouring the layer of foil to the general shape of the vehicle's dashboard which is visible through the windshield;
placing the contoured layer of foil on said dashboard;
trimming the contoured layer of foil to form a pattern;
placing said pattern on a covering material; and
cutting said covering material to form a cover for said dashboard.

4,449,748

UTILITY VEHICLE BODY

Ernst Fiala; Fritz Schael, and Reiner Schoedder, all of Wolfsburg, Fed. Rep. of Germany, assignors to Volkswagenwerk Aktiengesellschaft, Fed. Rep. of Germany

Continuation of Ser. No. 918,473, Jun. 23, 1978, abandoned. This application Mar. 13, 1981, Ser. No. 243,475
Claims priority, application Fed. Rep. of Germany, Jul. 6, 1977, 2730425
Int. Cl.³ B62D *23/00*
U.S. Cl. 296—183 **11 Claims**



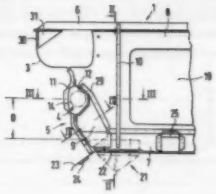
1. A self supporting body for a utility vehicle comprising a closed cab portion, having front, rear, and side walls, mounted only on the front wheels of said vehicle and an open cargo portion mounted only on the rear wheels of said vehicle, said cab portion having a bending and torsion resistant construction, including a torsion resistant frame having a closed cross sectional configuration and forming a structural component extending around the entire circumference of said rear wall of said cab portion, and said cargo portion having an approximately U-shaped transverse cross-section, said cargo portion being of itself bending resistant in the longitudinal direction of the vehicle and torsion yielding, and said cargo portion being rendered torsion resistant by attachment to said torsion resistant frame.

4,449,749

PASSENGER CAR BODY END WALL

Georg Eger, Pleidelsheim, Fed. Rep. of Germany, assignor to Dr. Ing. h.c.F. Porsche AG, Fed. Rep. of Germany

Filed Mar. 25, 1982, Ser. No. 361,796
Claims priority, application Fed. Rep. of Germany, Apr. 9, 1981, 3114415
Int. Cl.³ B62D *31/00*
U.S. Cl. 296—194 **15 Claims**



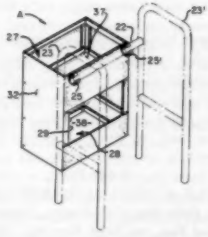
1. A car body end wall, extending generally perpendicularly to the direction of vehicle travel, having a transverse wall interconnecting fenders of the car and attached to fender walls and longitudinal supports of the fenders; comprising a frame system including upper and lower transverse members which are mounted higher and lower than said longitudinal supports, respectively, plate means flanged and disposed vertically at a distance from the median longitudinal plane of the car body for joining the upper and lower transverse members and the transverse wall, said plate means extending in the longitudinal direction of the vehicle and having rigidifying shaped portions, and reinforcing means for connecting the lower transverse member to the longitudinal supports.

4,449,750

ACCESSORIES FOR WHEELCHAIRS AND THE LIKE

Martin D. Pultman, 550 Coeur De Royale Dr., St. Louis, Mo. 63141

Filed Sep. 9, 1982, Ser. No. 416,268
Int. Cl.³ A47C *7/62*; B60R *11/00*
U.S. Cl. 297—188 **8 Claims**



1. A container accessory for a walker or like mobility aid having a transversely extending tubular frame member located at the front of the user, said accessory comprising a framework and parallel members supported by said framework to define upper and lower rectangular compartments located in aligned over-and-under relationship one above the other, the upper compartment being open at the top, to define a rectangular upper opening facing upwardly in front of the user, the lower compartment being of bin-like configuration and defining a rectangular lower opening facing rearwardly toward the user in always open condition, the lower compartment being closed entirely on three sides by side wall panels and a front wall

panel but being only partly closed rearwardly by a rear wall panel extending below said lower opening, whereby a major extent of said lower compartment is located below said lower opening for reliable containment of items, the lower opening thereby being presented to the user for permitting access to said lower compartment only by the user while concealing said lower compartment for out-of-sight containment of items, said framework and panel members being of strong, lightweight material for avoiding objectionable addition to the weight of the walker such as would disturb its balance or prevent its convenient use as a mobility aid, and resilient securement means for removable resilient securement of the container accessory to said transversely extending tubular frame members with said container accessory located in front of the user and with said upper compartment opening proximate said tubular frame member, said resilient securement means comprising at least first and second spring clips carried by said container accessory at a location above the center of gravity of said accessory for suspending of said accessory from said transversely extending tubular frame member, said spring clips being located at opposite sides of said rear wall proximate the opening of said upper compartment for resiliently gripping said transversely extending tubular frame member, thereby to reliably support said accessory.

2. A container accessory for removable securement to a wheelchair having first and second tubular frame members, said accessory comprising a framework and panel members supported by said framework to define at least one compartment, said framework being self-supporting, said framework and panel members being of strong, lightweight material, and at least first and second resilient securement means carried by said framework at locations upon said framework for resiliently engaging portions of said tubular frame members to cause said framework to be reliably supported by said tubular frame members, said resilient securement means comprising respective spring clips, said spring clips being located above the center of gravity of said accessory for suspending of said accessory from said tubular frame members, first and second ones of said spring clips resiliently engaging respective first and second ones of said tubular frame members for suspending said accessory above said center of gravity, said framework including a lower extension member below said center gravity for extending laterally toward said wheelchair, said extension member having an outer end carrying a third spring clip for resiliently gripping a tubular frame member of said wheelchair to maintain said accessory in stable orientation spaced from said wheelchair.

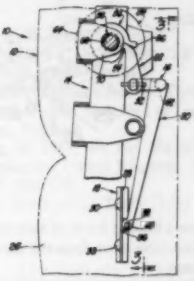
4,449,751

SEAT BACKREST HAVING AN ADJUSTABLE LUMBAR SUPPORT

Randall T. Murphy, Farmington Hills, and Dennis H. Heling, Canton, both of Mich., assignors to Lear Siegler, Inc., Livonia, Mich.

Filed May 26, 1981, Ser. No. 267,127
Int. Cl.³ A47C *3/00, 7/46*
U.S. Cl. 297—284 **4 Claims**

1. A lumbar support regulating apparatus comprising:
a seat back having a rigid frame;
a bar pivotally mounted on the frame for pivoting around a horizontal axis;
a lumbar support plate;
a cantilevered element supported by said bar for, in turn, supporting said lumbar support plate;
a rigid follower having first and second end portions, the first end portion of the follower being attached at one end of the bar to rotate therewith;
regulating means rotatably mounted on said frame and including a cam rotatable about a cam axis, the cam having a radially disposed external cam surface circumferentially extending in a first direction from a first lumbar support position through at least one intermediate lumbar support position to a last lumbar support position proximate the first lumbar support position, the cam surface being adapted for engagement with the second end portion of said follower wherein rotation of said regulating means in the first direction away from the first support position and towards the last lumbar support positions pushes the follower away from the axis of rotation of the cam to rotate said bar to thereby vary the position of the support plate, wherein a first radial distance between the cam axis and the cam surface at the first lumbar support position is less than a second radial distance between the cam axis and the cam surface at the intermediate lumbar support position which, in turn, is less than a third radial distance between the cam axis and the cam surface at the last lumbar support position and wherein the ratio of the difference between the first and second radial distances to the circumferential distance between the first and the intermediate lumbar support positions is greater than the ratio of the different between the second and third radial distances to the circumferential distance between the intermediate and last



lumbar support position to thereby provide the cam with a greater and greater amount of mechanical advantage as the cam is rotated in the first direction, said second end portion of said follower including a tongue projection engageable with said cam surface, said cam surface having a recessed portion at each lumbar support position for receiving said tongue projection to hold said cam in a selected lumbar support position, said cam including a stop protuberance extending radially above said cam surface immediately adjacent and between the first and last lumbar support positions to prevent rotation of said cam beyond the last lumbar position said recessed portion at said first lumbar position extending radially deeper into said cam than the remaining recessed portions to lock said tongue projection into said first recessed portion against said stop protuberance to prevent movement in the opposite direction as said tongue projection is prevented by said first recessed portion and said stop protuberance from moving therepast.

4,449,752

VEHICLE SEAT POSITION CONTROL MECHANISM WITH NEUTRAL MEMORY

Jun Yasumatsu, Toyota; Mamoru Mori, Okazaki; Toshihito Nishiwaki, and Akira Owada, both of Toyota, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Japan

Filed Sep. 27, 1979, Ser. No. 79,567
Claims priority, application Japan, Mar. 6, 1979, 54-28270[U]
Int. Cl.³ B60N *1/04*
U.S. Cl. 297—341 **4 Claims**

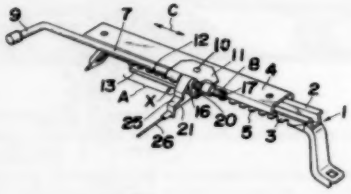
1. A neutral position return mechanism for a vehicle seat having a seat track including a lower rail, a locking plate secured to the lower rail, an upper rail slidably carried on the lower rail, a locking lever engageable with a series of locking teeth of the locking plate and a maneuverable shaft fixedly secured to the locking lever which is always rotatably urged

by the rotating force of a torsion spring in a seat locking direction comprising:

a memory member, elastically disposed at a side end thereof and outside the locking teeth of the locking plate, extending along the zone of the locking teeth of the locking plate from a neutral position of the seat toward the forward portion of the vehicle, said memory member being spaced from said locking plate so that a gap is formed between said memory member and said locking plate,

a rotatable member rotatably journaled with the maneuverable shaft and disposed at the end thereof within the gap between said memory and the locking plate so that the side end of said memory member is located within a rotating trace of said rotatable member at positions along the length of said locking plate, and

a connecting means between said rotatable member and a back of said vehicle seat for rotating said rotatable member against a biasing force of said torsion spring in a disengaging direction upon forward tilting of the back of said vehicle seat,



said rotatable member being rotatable by movement of said connecting means in a disengaging direction from a locking position of the locking lever, where it engages the locking teeth of said locking plate, to a disengaged position, where the locking lever is disengaged from the teeth of the locking plate and the end of the rotatable member moved out of said side end of said memory member, and

said memory member being disposed at said side end thereof outside the teeth of the locking plate and disposed within the rotating trace of the end of said rotatable member so that the surface of said rotatable member nearest said locking lever retains the locking lever in the disengaged position when the end of said rotatable member contacts the outside of said side end of said memory member.

4,449,753

METHOD FOR BULKING FULL A RETORT

Thomas E. Ricketts, Grand Junction, Colo., and Allan Sass, Los Angeles, Calif., assignors to Occidental Oil Shale, Inc., Grand Junction, Colo.

Filed Jun. 1, 1982, Ser. No. 383,508

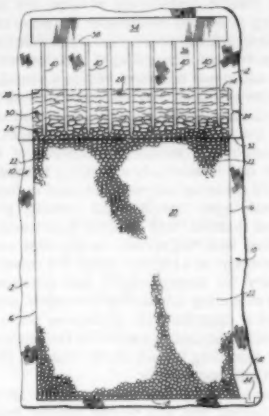
Int. Cl.³ E21B *43/247*; E21C *41/10*

U.S. Cl. 299—2 **57 Claims**

1. A method for forming an in situ oil shale retort in a retort site in a subterranean formation containing oil shale, the in situ retort containing a body of expanded oil shale formation and having top, bottom, and generally vertically extending side boundaries of unfragmented formation, the method comprising the steps of:

forming a lower portion of the body of expanded oil shale formation comprising a fragmented permeable mass of formation particles; and thereafter

explosively expanding a layer of unfragmented formation downwardly toward the lower portion of the body of expanded formation for forming the remaining portion of the body of expanded formation, the layer having a volume sufficient to provide that the available void fraction for expansion of the layer is no more than about ten percent so that the remaining portion of the body of expanded formation completely fills the retort to its top boundary.



4,449,754

DEVICE FOR BREAKING MONOLITHIC STRUCTURES BY PULSEWISE LIQUID PRESSURE

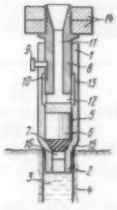
Naum Y. Orlov, Kharkov, and Taras P. Dotsenko, Moscow, both of U.S.S.R., assignors to Vsesojuzny Proektno-Izyskatelsky I Nauchno-Issledovatelsky Institut "Gidropoekt" Imeni S.Ya. Zhuka, Moscow, U.S.S.R.

Filed Jun. 10, 1982, Ser. No. 386,919

Claims priority, application U.S.S.R., Nov. 24, 1980, 3006632; Dec. 3, 1981, 3356551

Int. Cl.³ E21C *37/12*

U.S. Cl. 299—21 **9 Claims**



1. A device for breaking monolithic structures by the pulsating pressure of a liquid occupying a hole pre-drilled in the structure to be shattered, comprising:

a tubular housing;

a cavity in said housing to accommodate an explosive charge;

a partition of an elastomeric material secured inside said housing to close said cavity at one end of said housing;

a pipe portion at the end of said housing adjacent to said partition adapted to fit into a mouth of said hole and to be filled with the liquid so as to form an air gap between the surface of the liquid and said partition;

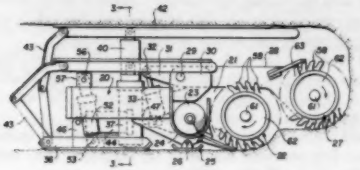
means for retaining said housing inside the hole when a pulsating liquid pressure is induced, said means being provided with an inertia element; and

a partially-movable joint connecting said element with said housing.

4,449,755
THIN SEAM MINING MACHINE

Rodney L. Nelson, Box N, Falls Creek, Pa. 15840

Filed Sep. 30, 1982, Ser. No. 431,720
Int. Cl.³ C21C 27/24
U.S. Cl. 299—31 14 Claims

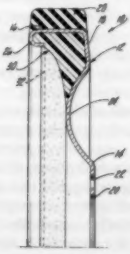


1. A thin seam mining machine comprising a main frame having a forward boom extension, a first rotary cutter head on said boom extension, a cross conveyor for cuttings on the main frame rearward of the first rotary cutter head, the main frame having a transverse axis fulcrum, a boom pivotally mounted upon the main frame for vertical swinging on a transverse pivot axis and projecting forwardly of said boom extension, a second rotary cutter head on said boom in advance of the first rotary cutter head and somewhat above the latter, the first and second rotary cutter heads counter-rotating in the operation of the machine to deliver cuttings to said conveyor, a power cylinder connected between the rear end of said boom and said main frame rearward of the boom pivot and being operable to swing the boom on its pivot, at least a power cylinder connected with the main frame rearward of the fulcrum and being operable to rock the main frame on said fulcrum, side-by-side pairs of connected floor and roof engaging plates disposed above and below the main frame and rearward of the first and second rotary cutter heads, alternately operating jacks connected between the pairs of floor and roof engaging plates to expand and retract the pairs of plates alternately, and a pair of parallel longitudinal axis side-by-side power cylinders connected between the floor engaging plates of the pairs and the main frame and being alternately operable in timed relationship with the operation of said jacks to advance the main frame into a seam and to pull forwardly the inactive pair of floor and roof engaging plates preparatory to another advancement of the main frame.

4,449,756
TRACKED VEHICLE ROAD WHEEL

James B. Weeks, Haslett, Mich., assignor to Motor Wheel Corporation, Lansing, Mich.

Filed Mar. 9, 1982, Ser. No. 356,457
Int. Cl.³ B60B 3/00, 7/02
U.S. Cl. 301—37 P 15 Claims

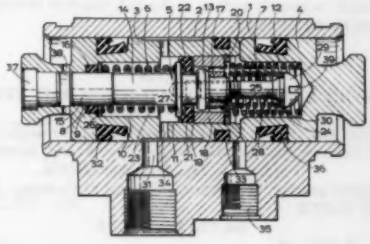


1. A composite wheel for tracked vehicles and the like comprising a generally cup-shaped disc wheel including a disc and an annular rim extending axially from the periphery of said disc, and a body of elastomeric material affixed to said wheel internally of said rim and having a pitched outer surface of closed cellular water-resistant construction extending axially and radially from said disc at a radially inner surface edge to adjacent the disc-remote edge of said rim at a radially outer surface edge and being sealed to adjoining surface portions of said disc and rim at said edges, said surface being concave and having a slope at said radially inner surface edge which is at a greater angle with respect to the axis of said wheel than is the slope at said radially outer edge, and with no portion of said surface facing radially outwardly.

4,449,757
HYDRAULIC ACTUATOR FOR A VEHICLE INTERNAL SHOE-DRUM BRAKE

Heinrich B. Rath, Vallendar, and Alfred W. Thomas, Koblenz, both of Fed. Rep. of Germany, assignors to Lucas Industries Limited, Birmingham, England

Filed Aug. 20, 1981, Ser. No. 294,432
Claims priority, application United Kingdom, Aug. 23, 1980, 8027508; Mar. 6, 1981, 8107147
Int. Cl.³ F16D 65/24; B60T 11/34
U.S. Cl. 303—6 C 7 Claims



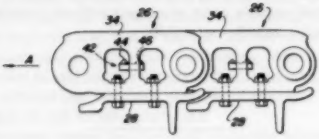
1. An hydraulic actuator for a vehicle internal shoe-drum brake, said actuator comprising a piston and cylinder assembly having relatively movable parts, said assembly having a housing, means defining a bore in said housing, and one of said relatively movable parts comprising a first piston working in said bore, means defining a pressure chamber in said actuator, fluid in said pressure chamber acting between said relatively movable parts to apply said brake, and said actuator incorporates a proportioning valve, said proportioning valve comprising a valve head for engagement with a seating, first and second stems projecting from said head in each of two opposite directions, at least one said stem projecting through said first piston, each said stem being of an area smaller than that of said head, said first stem being provided with a shoulder, and said second stem being provided with an enlargement, a seal located between said first stem and said first piston, an abutment adjacent said seal, a first spring acting between said abutment and said shoulder on said first stem to urge said head in a first direction away from said seating and into engagement with a stop, and a second spring acting on said enlargement on said second stem also to urge said head in said first direction and to augment the force in said first spring, and the other of the said relatively movable parts being provided with a longitudinally extending recess, said second stem and said second spring both projecting into said recess.

4,449,758

SPROCKET RECEPTACLE CLEANER EMBODIED IN A TRACK SECTION

William P. Wohlford, Bettendorf, Iowa, and Howard V. Beitel, Moline, Ill., assignors to Deere & Company, Moline, Ill.

Filed Feb. 1, 1982, Ser. No. 344,670
Int. Cl.³ B62D 55/20, 55/24
U.S. Cl. 305—12 7 Claims



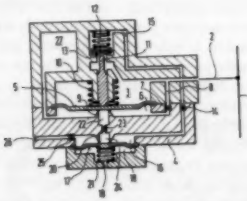
1. A track section for forming part of an endless track for a track laying vehicle, comprising: a link assembly, which, as viewed from the top as it would appear in a lower track run, includes right- and left-hand, spaced-apart rail portions; a sprocket-engaging portion interconnecting respective first ends of the rails portions and defining a cylindrically-curved, upwardly-facing surface adapted for engagement with receptacles formed between and defined at least partly by adjacent teeth of a drive sprocket; a receptacle-cleaning portion interconnecting the rail portions at respective locations located in parallel spaced relationship to the sprocket-engaging portions with the distance between the sprocket-engaging and receptacle-cleaning portions being substantially equal to the pitch of a sprocket with which the link is adapted to be used; and said receptacle-cleaning portion having at least one upwardly-projecting, beveled rib dimensioned for sweeping close to a sprocket receptacle surface as the link becomes drivingly engaged by the sprocket.

4,449,759

SERVICE BRAKE ACCELERATOR FOR RAIL VEHICLE AIR BRAKE SYSTEMS

Herbert Eder, Markt Schwaben, Fed. Rep. of Germany, assignor to Knorr-Bremse GmbH, Munich, Fed. Rep. of Germany

Filed Jul. 8, 1982, Ser. No. 396,501
Claims priority, application Fed. Rep. of Germany, Jul. 14, 1981, 3127775
Int. Cl.³ B60T 15/38
U.S. Cl. 303—38 3 Claims



1. A pulsating device brake accelerator for rail vehicle air brake systems, said accelerator cyclically venting air from a main air supply to atmosphere, and returning to a neutral position between its working cycles and at the end of a brake line pressure drop, said accelerator comprising

(a) a first movable abutment (5) subject to the pressure in a line chamber (3) connected to a main air supply (1), and, against the force of a spring (10), to the pressure in a reference pressure chamber (6) connected to said main air supply through a nozzle (7);

(b) said first movable abutment, upon application of overbalancing pressure, effecting the opening of a first valve means (5, 9) in a connection, through a first choke (23), between said reference pressure chamber and a first chamber (24) bounded by a valve seat (20);

(c) a second movable abutment (17) seatable upon said valve seat under pressure of a spring (21) so as to close said valve seat, and forming a second valve means (17, 20) in combination with said valve seat;

(d) a second chamber (16) separated from said first chamber by said valve seat, said second chamber being in continuous communication with atmosphere through a ventilation channel (26) with a second choke (25);

(e) a channel (15) with a third choke (14), connecting said main air supply with atmosphere, through a shut-off valve (12, 13) adapted to be opened laggingly after one of said valve means by a said movable abutment;

(f) said shut-off valve (12, 13) being disposed for opening by said first movable abutment (5) laggingly after said first valve means (5, 9);

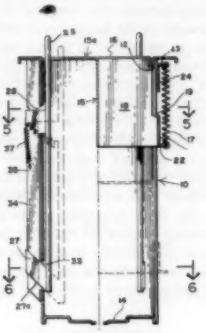
(g) said channel (15) terminating in said second chamber (16).

4,449,760

SELF-LEVELING PLATE DISPENSER

Bruce F. House, Miami, Fla., assignor to Shelley Manufacturing Company Division of Allo Food Service Equipment Company, Miami, Fla.

Filed Feb. 14, 1983, Ser. No. 440,852
Int. Cl.³ A47F 1/10
U.S. Cl. 312—42 6 Claims



1. In a self-leveling plate dispenser of the type having a vertically-extending, open-top tank for receiving stacked plates, dishes or platters to be dispensed and including mechanism resiliently constraining the stacked plates, dishes or platters therein in the upward direction from underneath for dispensing from the top of the tank, the improvement comprising, mechanism for vertically guiding within the tank any one, selectively, of an incrementally increasing range of peripheral sizes of such stacked plates, dishes or platters, said vertically guiding mechanism comprising a plurality of vertically-disposed guide rods circularly spaced within the tank, means for independently stepwisely adjusting each of said guide rods along a range of distances extending radially outwardly of the central longitudinal axis of the tank, said guide rods serving as abutment slide means for guiding peripheral edge portions of any selected one of a range of incrementally increasing sizes and peripheral shapes of stacked plates, dishes or platters placed in the tank for dispensing, said guide rod adjusting means for each of said stepwise adjusting means comprising hook means fixed to and extending radially outwardly of said guide rod and projecting through a slot in the tank, said hook means comprising a hook member having a plurality of vertically-extending recesses of incrementally increasing depth from the inner to the outer end along the bottom thereof, resilient means normally constraining said hook member and its associated guide rod in a downward, longitudinal direction within the tank, the

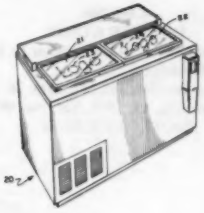
recesses of said hook member being selectively placeable over the lower edge of said tank slot for adjustably positioning said guide rod in a predetermined radially-outward distance with respect to the central longitudinal axis of the tank.

4,449,761

TRANSPARENT REFRIGERATOR DOORS WITH FROSTED PRODUCT LOGO THEREON

Charles L. Davis, Atlanta, and G. Merle Bachman, Stone Mountain, both of Ga., assignors to The Coca-Cola Company, Atlanta, Ga.

Filed Nov. 25, 1981, Ser. No. 324,683
Int. Cl.³ A47B *77/08*; A47F *3/04*
U.S. Cl. 312—116 **12 Claims**



1. A display type of refrigeration unit for storing a multiplicity of beverage containers of the type having a source-identifying logo thereon, the beverage being of the type generally served chilled, the unit comprising

a cabinet open at one side and having means therein for displaying the beverage containers in a manner suitable for use in a commercial environment, and

at least one door attached to the cabinet in such a manner as to cover the opening in the cabinet and by relative movement with respect to the cabinet permitting access to beverage containers stored in the cabinet, the door comprising

a first transparent substrate having on a first surface thereof the source-identifying logo enlarged so as to extend over a significant portion of the first surface, the source-identifying logo being applied by silk screen and being colored so as to convey to a customer a frosted effect, and

a second transparent substrate juxtaposed to the first transparent substrate and incorporating the source-identifying logo therebetween such that an inexpensive construction is provided wherein the frosted source-identifying logo serves to suggest to the customer an impression associated with the cool refreshment of the beverage in the containers stored therein.

4,449,762

COMPUTER DESK

Jeffrey A. Turner, 2901 W. Laurel La., Phoenix, Ariz. 85029

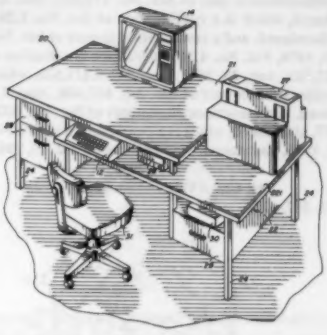
Filed Mar. 23, 1981, Ser. No. 246,143
Int. Cl.³ A47B *21/00*; G06C *7/02*
U.S. Cl. 312—196 **8 Claims**

1. A computer desk for use with a computer, keyboard terminal, and peripherial devices while preserving a clear desk top work space comprising:

an unencumbered horizontal planar desk top work surface;

means for emplacing and fully supporting a computer, keyboard terminal, and peripherial devices directly below said desk top work surface comprising a support surface coupled below said desk top work surface a distance sufficient to provide support for a computer, keyboard terminal, and peripherial devices between the two surfaces; and

said desk top work surface and said support surface each comprises an edge nominally facing a user seated at said desk and said edge of said support surface is advanced toward said user to permit support of a computer, keyboard terminal, and peripherial devices while providing



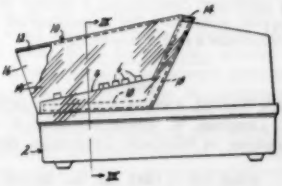
convenient usable access to the keyboard of a terminal so emplaced and supported unimpeded by said desk top work surface.

4,449,763

PROTECTIVE COVER FOR KEYBOARD MACHINES

Loren A. Barnett, 920 Durward Hall Dr., Carthage, Mo. 64836

Filed Oct. 23, 1981, Ser. No. 314,123
Int. Cl.³ A47B *21/00*, *97/00*
U.S. Cl. 312—208 **6 Claims**



1. A protective cover for a keyboard machine having a housing presenting an upwardly facing keyboard carrying pushbuttons operable by depression thereof, said cover comprising:

a. a hood including a transparent top wall generally parallel with and spaced above said keyboard by a distance sufficient to permit insertion of an operator's hand therebetween, but sufficiently small to require the operator to press said pushbuttons principally with finger movements and with only minimal movements of his whole hand normally to the keyboard, and to prevent any substantial whole-hand movements normally to the keyboard, said hood being open at one side to permit said insertion, and

b. means operable to attach said hood firmly to the housing of said machine.

4,449,764

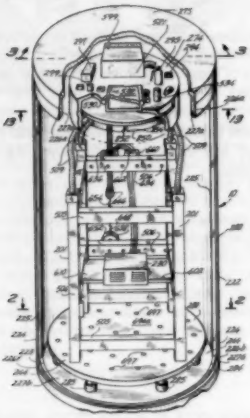
DATA PROCESSING EQUIPMENT ENCLOSURES

Otis H. Hastings, Mahwah, N.J., assignor to Transaction Security, Inc., Montvale, N.J.

Continuation-in-part of Ser. No. 119,816, Feb. 8, 1980, abandoned, which is a continuation of Ser. No. 1,264, Jan. 5, 1979, abandoned, and a continuation-in-part of Ser. No. 952,782, Oct. 19, 1978, Pat. No. 4,348,966, which is a division of Ser. No. 827,593, Aug. 25, 1977, Pat. No. 4,121,523, which is a continuation-in-part of Ser. No. 602,404, Aug. 7, 1975, abandoned, and a continuation-in-part of Ser. No. 825,174, Aug. 16, 1977, abandoned, which is a continuation of Ser. No. 602,404, Aug. 7, 1975, abandoned. This application Jul. 13, 1981, Ser. No. 282,708

Int. Cl.³ A47B *77/08*; F25D *23/12*

U.S. Cl. 312—236 **33 Claims**



1. A transaction processing enclosure for housing of electronic data processing equipment and the like comprising, in combination, at least one access means to the interior of said enclosure; closure means registrable with said access means; said enclosure including a frame comprising hollow conduit support members arrayed at spaced intervals to provide a unitary support structure adapted to receive and store said data processing equipment components; a number of said hollow conduit support members being interconnected in a manner such as to distribute a fluid therethrough.

4,449,765

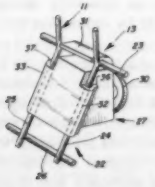
DISHRACK WHEEL ASSEMBLY FOR A DISHWASHER

William T. Lampman, St. Joseph Township, Berrien County, Mich., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed Jun. 7, 1982, Ser. No. 385,855

Int. Cl.³ A47B *88/04*

U.S. Cl. 312—311 **8 Claims**



1. In a dishwasher having a cabinet defining outer sidewalls at opposite sides of a dishwashing space within the cabinet, horizontal tracks on the sidewalls, and a dishrack, a pair of improved wheel assemblies for movably carrying the dishrack on the sidewall tracks for movement into and from the dishwashing space, each said wheel assembly comprising:

a wheel having a hub and a track-engaging peripheral portion;

support means on said dishrack including a horizontal top element extending longitudinally parallel to the track, and a pair of downwardly and inwardly inclined spaced side elements; and

a carrier having means for journaling the hub of the wheel for rolling on the tracks, a top hook opening horizontally when hooked onto said top element for retaining the carrier against downward displacement, and opposed side hooks embracing said inclined side elements for retaining the carrier in a preselected position against outward swinging movement about said top element.

4,449,766

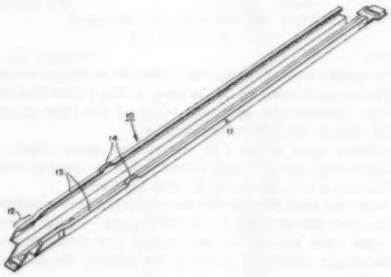
DRAWER GUIDE

James G. Shook, Goldsboro, N.C., assignor to Kemp Furniture Industries, Inc., Goldsboro, N.C.

Continuation of Ser. No. 383,237, May 28, 1982. This application Aug. 11, 1982, Ser. No. 407,142

Int. Cl.³ A47B *88/04*

U.S. Cl. 312—348 **3 Claims**



1. A drawer guide for mounting in a housing for slideably engaging a drawer having a flexible engaging means comprising: a stationary slide member, said slide member having a relatively short frontal neck portion and an extended body portion, said neck portion for facilitating initial drawer insertion into the housing, said slide member having first and second c-shaped rail means, said first and second c-shaped rail means being opposingly spaced, said rail means having a close forward opposition and less close rearward opposition, a pair of mound-like stop means, one of said pair of stop means situated on said first c-shaped rail means and the other of said pair of stop means being positioned on said second c-shaped rail means, said pair of mound-like stop means for contacting the engaging means for retarding movement of the drawer whereby sufficient pressure will cause the engaging means to flex and override said stop means.

4,449,767

CONNECTOR ASSEMBLY HAVING IMPROVED KEYING AND LATCHING SYSTEM

Charles H. Weidler, Lancaster, Pa., assignor to AMP Incorporated, Harrisburgh, Pa.

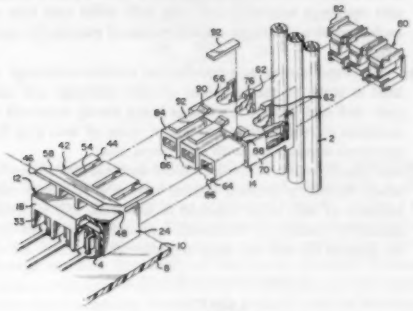
Filed Aug. 30, 1982, Ser. No. 412,685

Int. Cl.³ H05K *1/00*; H01R *13/62*

U.S. Cl. 339—17 LC **10 Claims**

1. An electrical connector assembly of the type comprising first and second connector housings, each of the housings having a mating face and a rearward face which faces oppositely with respect to the mating face, external housing walls extending from the mating face to the rearward face, the external walls comprising oppositely facing sidewalls and oppositely facing endwalls, terminals in the housings which are coupled to each other when the housings are mated with each

other, at least one latch arm on the first housing, the latch arm having a latching end and an actuating end and being hinged to one of the external housing walls intermediate its ends, the actuating end being proximate to the rearward face and the latching end being proximate to the mating face, the second housing having latching shoulder means thereon on one of the external walls thereof for cooperation with the latching end to latch the housings to each other when they are in a mated condition, the actuating end being movable towards the plane of the one external wall with concomitant movement of the latching end away from the plane of the one external wall thereby to unlatch the housings, and a keying system on the housings for keying the housings to each other, the connector assembly being characterized in that:



the keying system comprises a plurality of parallel keyways in the first housing and a like plurality of removable keys on the second housing, the keyways being in the one external housing wall and extending inwardly from the mating face of the first housing, the latch arm extending over, and in covering relationship to, the keyways, the latch arm having inspection slots therein which are in alignment with the keyways to permit inspection of the keyways,

the keys being on the one external wall of the second housing which corresponds to the one external wall of the first housing, the keys being in alignment with, and being dimensioned to be received in, the keyways whereby, the first and second housings can be distinctly keyed to each other by removing one of the keys from the second housing and placing a key plug in the corresponding keyway in the first housing, and the location of the key plug can be determined from the inspection slots so that the first and second housings can be recognized as associated housings.

4,449,768

SHIELD CONNECTOR

Kenneth J. Koncelik, Brook Park, and Erwin H. Goetter, Chesterland, both of Ohio, assignors to Preformed Line Products Company, Mayfield Village, Ohio

Filed Jul. 23, 1981, Ser. No. 286,335
Int. Cl.³ H01R *4/66*
U.S. Cl. 339—14 R **14 Claims**

1. In a shield connector for shielded cables, said connector being of the type including inner and outer metal plates respectively positionable on inner and outer sides of a cable shield, said inner plate having shield penetration means projecting therefrom toward said outer plate for penetrating a cable shield when said plates are clamped together, said outer plate including a generally planar main portion having opposite legs extending therefrom for normally maintaining said main portion in spaced relationship relative to said inner plate, and adjustable fastener means for clamping said plates together on opposite sides of a cable shield, the improvement comprising:

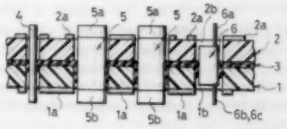
an intermediate plate positioned between said outer plate and the outer surface of the cable shield, said intermediate plate being engageable by said legs on said outer plate and having penetration means extending therefrom toward said inner plate for penetrating a cable sheath when said plates are clamped together, said intermediate plate having opposite end portions which extend transversely of the longitudinal axis of a cable on which said connector is used, one of said end portions being substantially flat and the other of said end portions being arcuately curved to generally correspond with the curvature of the cable.

4,449,769

SUBSTRATE FOR MOUNTING ELECTRIC PARTS

Mikio Kobayashi, and Kingo Kuritani, both of Furukawa, Japan, assignors to Alps Electric Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 138,653, Apr. 8, 1980, abandoned. This application Jun. 11, 1982, Ser. No. 387,497
Claims priority, application Japan, Apr. 11, 1979, 54-43795
Int. Cl.³ H05K *1/18*
U.S. Cl. 339—17 C **3 Claims**



1. A two-sided printed circuit board comprising first and second substrates arranged back-to-back with printed circuit patterns being formed on their respective outer faces, said substrates having aligned openings defining passageways through said circuit board for receiving portions of electric components to be soldered to said circuit patterns, said passageways each being wider than its component portion adapted to be received therein to enable said portions to be fitted easily within said passageways, and means including a tape having adhesive material on each side interposed between said substrates and extending at least partially across said passageways for holding said substrates together while providing portions of adhesive tape within said passageways that can be deflected along wall portions of said passageways upon insertion of said components thereinto for holding electric components therewithin during soldering of said components to said circuit patterns, the portions of said tape deflected along said wall being substantially a full thickness thereof.

4,449,770

SOCKETLESS SEPARABLE CONNECTOR

Dimitry G. Grabbe, Lisbon Falls, Me., and Iosif Korsunsky, Harrisburg, Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed May 22, 1981, Ser. No. 266,399
Int. Cl.³ H01R *23/72*
U.S. Cl. 339—17 CF **4 Claims**

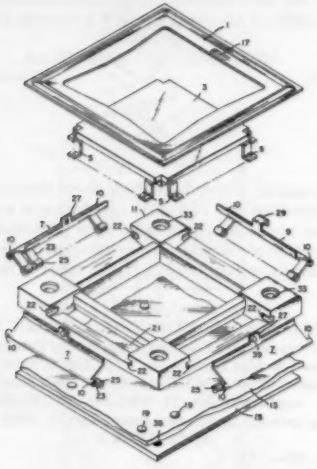
1. A separable electrical connector, comprising:

a semiconductor chip carrier having leads extending therefrom;

a frame adjacent to said carrier, said leads extending through said frame;

circuit board means adjacent to said frame and having electrically conductive pads thereon in alignment with said leads, each of said leads being disposed on one of said pads;

a spring means disposed on each side of said frame, said spring means having a plurality of electrically insulating



tips for engaging each of said leads so as to cause said leads to be compressed against the pads thereby providing electrical communication between said leads and said pads, said spring means further having a finger extending upward from said spring means for engagable engaging a yoke means;

yoke means pivotally attached to one of said fingers for engaging remaining said fingers so as to cause said spring members and thereby said tips to exert a contact-mating force between said leads and said pads.

4,449,771

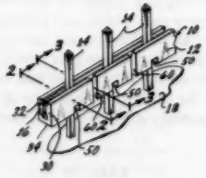
BUS BAR

David W. Carr, 7325 Muslo La., Carlsbad, Calif. 92008

Filed Dec. 10, 1979, Ser. No. 102,230

Int. Cl.³ H01R *13/02*

U.S. Cl. 339—19 **2 Claims**



1. In combination with a series of spaced terminal pins arranged in a row, a bus bar, comprising:

(a) an elongated bus bar body formed of non-conductive plastic material,

(b) said body being of U-shaped cross-section defined by parallel legs and a connecting web between said legs,

(c) said web having spaced openings therealong mating with said terminal pins which extend therethrough, each opening being formed in said body by a slot removing the base of said U-shaped cross-section including said connecting web,

(d) each of said legs having on its inner surface facing the other leg a conductive metal strip extending parallel to the longitudinal axis of said body and positioned to bear on said pins, each of said legs having a groove therein and said strips being partially embedded in said grooves, the side of each groove toward said openings being undercut at an acute angle to the associated leg and each strip having a contour matching the associated groove so that each strip has a side toward said openings which is at an acute angle to the direction of entry of said pins through said openings whereby said pins will strike said side of each strip at a camming angle for ease of passage by each strip,

(e) said strips having non-conductive surface coverings at least at some of the locations of said openings and said pins, and said surface coverings being partly removed at locations corresponding at least to some of said pins for electrical conduction with said strips, and

(f) said plastic material being resilient and said strips thereby being resiliently pressed against said pins to insure that portions of said strips exposed to said pins will maintain electrical conduction therewith and so that said pins will be gripped for bus bar body retention thereon.

4,449,772

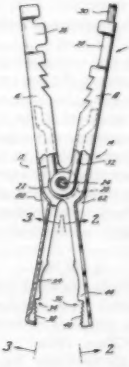
ELECTRICAL CONNECTOR FOR TOP AND SIDE MOUNT BATTERY TERMINALS

Thomas B. Johnson, III, St. Charles, Ill., assignor to Cooper Industries, Inc., Houston, Tex.

Filed Sep. 17, 1982, Ser. No. 419,288

Int. Cl.³ H01R *11/24, 27/00*

U.S. Cl. 339—29 B **5 Claims**



1. An electrical connector for top and side-mount battery terminals, comprising:

(a) a first member having a jaw for engaging a top-mount battery terminal and a terminal engaging surface for engaging the top of a side-mount battery terminal bolt head;

(b) a second member pivotally mounted with said first member having a jaw for engaging a top-mount battery terminal and two spaced prongs defining an open slot therebetween for receiving and electrically engaging the shoulder of a side-mount battery terminal bolt head; and

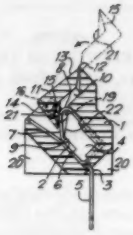
(c) spring means for biasing said first and second members to pivot toward each other for mutually clamping engagement about a current carrying member.

4,449,773

LOW INSERTION FORCE CONNECTOR

Wilhelm C. J. Esser, Tilburg, and Adrianus van den Nosterum, Boxtel, both of Netherlands, assignors to AMP Incorporated, Harrisburg, Pa.

Filed May 7, 1982, Ser. No. 376,067
Int. Cl.³ H01R 13/62
U.S. Cl. 339—59 M 4 Claims



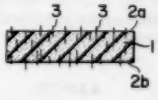
1. An electrical connector adapted for low insertion or withdrawal forces on a conductor and comprising a sheet metal contact mounted in an insulating housing having a passageway for receipt of the conductor, the contact having a spring finger presenting a contact portion projecting into the passageway and, forwardly of the contact portion, a forward portion extending in forwardly and outwardly inclined manner from the passageway into a cavity, which is in the housing, at a side thereof and having a housing part bordering a side of the passageway at the side of the cavity and moveably mounted on the housing adjacent the forward end of the passageway, the housing part being moveable into the cavity to engage the forward contact portion at a surface of the housing part facing away from the passageway to flex the spring finger and move the contact portion outwardly of the passageway, the housing part being connected to the housing by an integral hinge which extends beside, and parallel to, the passageway, the hinge being spaced from the passageway to allow the housing part to move along an arcuate path into the cavity.

4,449,774

ELECTROCONDUCTIVE RUBBERY MEMBER AND ELASTIC CONNECTOR THEREWITH

Nogami Takashi, Tokyo, and Mitsuhashi Masayuki, Saitama, both of Japan, assignors to Shin-Etsu Polymer Co., Ltd., Tokyo, Japan

Filed Jan. 27, 1982, Ser. No. 343,346
Claims priority, application Japan, Feb. 5, 1981, 56-16209; Feb. 24, 1981, 56-25742
Int. Cl.³ H01R 9/00
U.S. Cl. 339—59 M 15 Claims



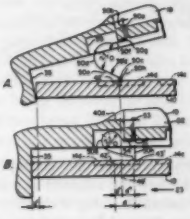
1. An electroconductive rubbery member which comprises a shaped body made of an electroconductive rubbery elastomer having two opposite surfaces and a multiplicity of electroconductive fibrous bodies each having a length substantially smaller than the thickness of the said shaped body between the two opposed surfaces and embedded in the said shaped body in such oriented dispersion that each of the fibrous bodies lies approximately along a line which intersects at least one of the said opposed surfaces, at least a part of the fibrous bodies being protruded out of at least one of the said two opposed surfaces of the shaped body.

4,449,775

CONNECTOR FOR PORTABLE OBJECTS SUCH AS CREDIT CARDS

Bertrand J. C. H. de Pommery, St-Nom-La-Breteche; Gérard L. R. Petiot, Champigny S/Marne; Jean-Claude E. Vergne, Angers, and Jean-Paul C. Goupil, Sevres, all of France, assignors to Compagnie Internationale pour l'Informatique CII-Honeywell Bull (Societe Anonyme), Paris, France

Division of Ser. No. 105,654, Dec. 20, 1979. This application Jan. 12, 1982, Ser. No. 339,052
Claims priority, application France, Dec. 27, 1978, 78 36544; Mar. 6, 1979, 79 05761; Aug. 14, 1979, 79 20644
Int. Cl.³ H01R 13/629
U.S. Cl. 339—75 MP 11 Claims



1. A connector adapted to have a portable object having contact terminals on one surface engage with contact elements within the connector upon insertion therein comprising a case, a chamber within said case, an opening leading into said chamber and adapted to receive said portable object along a predetermined direction, connecting means in said chamber for electrically connecting said portable object upon insertion into said chamber, said connecting means including electrical contact elements disposed to be actuated from a first stable idle position of the connecting means to a second operating position of the connecting means to cause landing of said contact elements on respective contact terminals and establish an electrical connection therebetween upon displacement of the portable object within the chamber, each of said contact elements being flexible and having, respectively, one fixed extremity affixed to said connecting means and one free contact extremity directed towards said opening, the free contact extremity being positioned to engage its respective contact terminal on the object upon the object being inserted into the chamber, and the contact element being formed to flex upon such engagement such that the free contact extremity moves in an opposite direction to the direction of insertion of the object and such that the relative movement between the free contact extremity and the respective contact terminal is greater than said displacement of the portable object within the chamber after landing of the contact element on the respective contact terminals.

4,449,776

ELECTRICAL CONNECTOR HAVING OPPOSED LOCKING RAMP MEMBERS

Robert A. Carmo, Placentia, and Ernest W. Dietz, Torrance, both of Calif., assignors to Pacific Electricord Company, Gardena, Calif.

Filed Sep. 13, 1982, Ser. No. 416,931
Int. Cl.³ H01R 13/62
U.S. Cl. 339—91 R 3 Claims

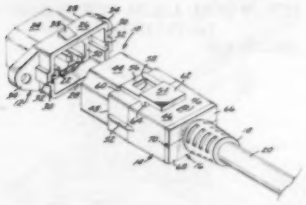
1. An electrical connector having opposed locking ramp members to resist connector and power cord separation forces, said electrical connector comprising:

a hollow first connector body including interiorly located,

axially extending electrical connector blades, and exteriorly located first ramp means;

a hollow second connector body adapted to fit within said first connector body in an insert position, said second connector body having an open end, ramp engaging means, and exteriorly located pivotable lock means adapted to ride up upon and latch behind said first ramp means in said insert position to lock said second connector body within said first connector body;

a strain relief fitting for mounting upon a power cord having axially extending electrical contacts for receiving said connector blades, said strain relief fitting including a collar; and



an insert assembly insertable into said open end of said second connector body and adapted to mount said electrical contacts, said insert assembly including a collar recess for receiving said collar and for constraining said strain relief fitting against axial movement relative to said insert assembly, said insert assembly further including exteriorly located second ramp means adapted to engage said ramp engaging means whereby axial forces on said strain relief fitting are transferred from said insert assembly to said second connector body by means of said second ramp means, and to said first connector body by means of said first ramp means.

4,449,777

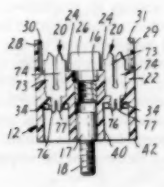
DROP WIRE CONNECTOR

Gary A. Baribeau, Troy, Wis., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Mar. 1, 1982, Ser. No. 353,050

Int. Cl.³ H01R *4/24, 13/58*

U.S. Cl. 339—103 R **11 Claims**



1. A drop wire connector comprising an insulating body member containing a central threaded socket insert and, at opposite sides thereof, two separate spring compression reserve contact elements retained within the central mass of said body, each of said elements having an upper bifurcate end for receiving and making electrical contact with an insulated copper-coated steel drop wire and a lower bifurcate end for receiving and making electrical contact with an insulated copper wire; an insulating cap member fitting over said body member and carrying a centrally positioned screw member for coacting with said socket insert, in forcing said cap against or away from said body, said cap member being doubly channeled to provide a wire receiving channel in alignment with each of said contact elements and being slotted to provide access for said elements into said channels; said body including centrally channeled upward end extensions and said cap including central end bulges slidably fitting within the channels of said end extensions and arms extending downwardly from front and rear edges; and means, including said end extensions, and said arms, for enclosing the space surrounding said upper bifurcate ends of said contact elements when said connector is in its extended open position.

4,449,778

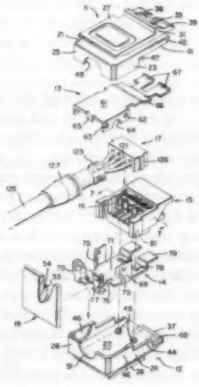
SHIELDED ELECTRICAL CONNECTOR

David Lane, Greensboro, N.C., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Dec. 22, 1982, Ser. No. 452,171

Int. Cl.³ H01R *13/648*

U.S. Cl. 339—143 R **5 Claims**



1. An electrical connector shield comprising base and closure members each stamped and formed in one piece from sheet metal with a rear, braid connecting portion and a front, contact portion, the braid connecting portion of the base member comprising a panel from respective opposite sides and the rear of which upstand flanges formed respectively with cable receiving apertures opening away from the panel, respective opposite sides of each aperture being provided with resilient, inturned cable gripping lips, the braid connecting portion of the closure member comprising a panel from opposite sides of which depend flanges formed with cable receiving apertures, aligned latching detents and apertures being provided on the flanges of the base and closure members so that the closure member can be latched to the base member substantially completely surrounding and retaining a cable with exposed braid shield received as a press fit between the lips of preselected one of the apertures in the base and the contact portions being adapted to mate with contact portions of another similar electrical connector shield.

4,449,779

ELECTRICAL CONNECTOR

Michael J. Hampshire, 792 Halifax Rd., Liversedge, West Yorkshire, England

Continuation of Ser. No. 152,028, May 21, 1980, abandoned. This application Sep. 22, 1982, Ser. No. 421,102

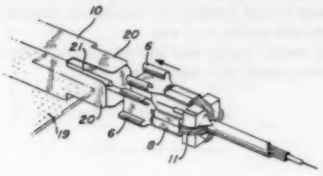
Claims priority, application United Kingdom, May 23, 1979, 7917909

Int. Cl.³ H01R *17/06*

U.S. Cl. 339—177 R **13 Claims**

1. An electrical connector having mating connector halves for use with a coaxial cable having an outer conductor com-

prised of a plurality of strands and a central conductor covered with an insulating sheath and surrounded by the outer conductor, wherein one connector half comprises a plurality of first connector parts each adapted to receive and be connected to one of a number of component groups into which the individual conductors of the outer sheath of a coaxial cable are split portions of each of said first connector parts being deformable



to grip and positively connect strands of the group to the respective first connector part, the other connector half comprises a plurality of second connector parts complementary to and engageable with the first connector parts, and a connector for the central conductor of the coaxial cable surrounded by said second connector parts.

4,449,780

LIGHT PIPE, LASER WINDOW AND CHARGE STOCK THEREFOR

Carl F. Swinehart, University Heights, Ohio, assignor to Harshaw/Filtrol Partnership, Cleveland, Ohio

Division of Ser. No. 241,566, Mar. 9, 1981, Pat. No. 4,341,654, which is a division of Ser. No. 931,323, Aug. 7, 1978, Pat. No. 4,277,303. This application Jul. 12, 1982, Ser. No. 397,553

Int. Cl.³ G02B *1/02*

U.S. Cl. 350—1.1 **1 Claim**

1. A laser window produced from a melt-grown ingot of an alkali metal halide by addition to the melt from about 5 ppm to about 1000 ppm by weight of said melt, of each component of a combination getter consisting essentially of at least a slightly melt-soluble reactive oxide of boron as one component, and an insoluble but active silicon dioxide as the other component, and superheating said melt for a period of time sufficient to react at least some of each component with trace impurities present in said melt, said window having a breakdown threshold greater than about 6 J/cm^2 as measured for a 10.6 micron pulsed laser.

4,449,781

MULTIMODE OPTICAL FIBER COUPLER

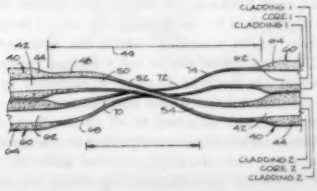
Alexander W. Lightstone, Montreal; H. Keith Eastwood, Beaconsfield, and Frank Szarka, Elmira, all of Canada, assignors to Her Majesty the Queen in Right of Canada as represented by the Minister of National Defense, Toronto, Canada

Continuation of Ser. No. 78,730, Sep. 25, 1979, abandoned. This application Nov. 20, 1981, Ser. No. 323,581

Claims priority, application Canada, Jul. 4, 1979, 331176

Int. Cl.³ G02B *7/26*

U.S. Cl. 350—96.15 **11 Claims**



1. An optical fiber coupler made from at least one source fiber having a predetermined ratio of cladding thickness to core diameter, said coupler being operative to couple together at least two optical fibers each of which includes a core of a light transmitting material having a high index of refraction, and a cladding of light transmitting material having a low index of refraction, said coupler comprising;

a portion of a first optical fiber having a biconally tapered section therein, and in which portion there is a first region of fiber on which the ratio of cladding thickness to core diameter is said predetermined ratio of one of said source fibers, the core thickness being between 50 and 75 microns and the cladding thickness being between 25 and 40 microns and in which there is a second region which includes the biconically tapered section, in which second region the cladding thickness has been reduced thus decreasing said predetermined ratio to one in which the cladding thickness to core diameter is not more than 25%; and

a portion of at least one other optical fiber having a biconically tapered section therein, and in which portion of said other optical fiber there is also a first region of fiber on which the ratio of cladding thickness to core diameter is the predetermined ratio of one of said source fibers, the core thickness being between 50 and 75 microns and the cladding thickness being between 25 and 40 microns and in which there is a second region which includes said biconically tapered section of said other optical fiber, in which second region the cladding thickness has been reduced hence decreasing said predetermined ratio to one in which the cladding thickness to core diameter is not more than 25%, the biconically tapered sections of each fiber extending in contact with one another and being fused over a portion of said biconically tapered sections.

4,449,782

MODULAR, OPTICAL FIBER COMMUNICATION SYSTEM

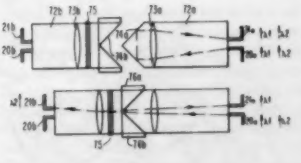
Hans-Erdmann Korth, Stuttgart, Fed. Rep. of Germany, assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 30, 1981, Ser. No. 258,990

Claims priority, application Fed. Rep. of Germany, May 24, 1980, 3019956

Int. Cl.³ G02B *5/14*

U.S. Cl. 350—96.16 **8 Claims**



1. For use in an optical communication system including an optical fiber bus, a self-collimating coupler for selectively coupling energy into or out of the bus, said coupler including:

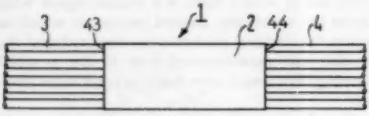
a first component having an optical input from the bus, an optical output to the bus, and a reference fare capable of reflecting input optical energy to the output, said first component being permanently coupled to the bus;

a second removable component having an optical output and a reference face, said second component being capable of being retained with at least a portion of its reference face in contact with the reference face of said first component, whereby optical energy applied at the input to said first component is coupled through both reference faces to the output from said second component.

4,449,783
OPTICAL STAR COUPLER WITH A PLANAR MIXER ELEMENT

Hans H. Witte, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Mar. 5, 1981, Ser. No. 240,870
Claims priority, application Fed. Rep. of Germany, Mar. 21, 1980, 3011059
Int. Cl.³ G02B 5/172
U.S. Cl. 350—96.16 **13 Claims**

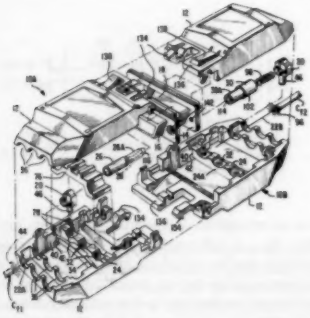


1. An optical star coupler for multi-mode light conducting fibers of a fiber optical system, said coupler including a mixing element and coupler fibers, said mixing element consisting of a planar waveguide having an input end and an output end, said ends being interconnected to two groups of said coupler fibers with a packing density of each group of coupler fibers at the input and output ends being as high as possible, said planar waveguide having a thickness being approximately equal to the diameter of each of the star coupler fibers, said coupler fibers being coupled to the input and output ends and being in the same plane with the mixing element, and each of the coupler fibers having a diameter approximately equal to a core diameter of the light conducting fibers of the fiber optical system so that substantially all of the light coupled from a fiber of the system into the coupler fiber is coupled into the mixing element and the losses of light being coupled from the mixing element through the coupler fiber to the fiber of the system are only due to losses from packing density.

4,449,784
HYBRID OPTICAL/ELECTRICAL CONNECTOR

Emma Basov, Des Plaines, and Igor Grois, Lincolnwood, both of Ill., assignors to TRW Inc., Redondo Beach, Calif.

Filed Jun. 22, 1981, Ser. No. 275,845
Int. Cl.³ G02B 7/26
U.S. Cl. 350—96.21 **19 Claims**

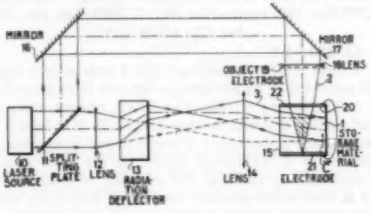


1. A hybrid optical and electrical connector comprising:
- a housing for receiving an optical cable including an optical fiber and an electrical cable and having a mating end;
- first clamp means in said housing for clamping at least said optical cable to said housing with an end portion of the optical fiber extending beyond said clamp means toward said mating end;
- at least one electrical contact in said housing to be connected to said electrical cable and having an end exposed toward said mating end;
- second clamp means in said housing to be clamped to said optical fiber end portion;
- gauge means in said housing between said second clamp means and said mating end having an end exposed toward said mating end;
- means supporting said second clamp means and said gauge means in said housing for movement toward and away from said mating end; and
- spring means urging said second clamp means and gauge means toward said mating end.

4,449,785
MULTIPLE HOLOGRAM BULK OPTICAL STORAGE DEVICE

Jean-Pierre Huignard, and Jean-Pierre Herriau, both of Paris, France, assignors to Thomson-CSF, Paris, France

Continuation of Ser. No. 11,924, Feb. 13, 1979, abandoned, which is a continuation of Ser. No. 781,450, Mar. 25, 1977, abandoned. This application Sep. 3, 1981, Ser. No. 299,224
Claims priority, application France, Mar. 30, 1976, 76 09209
Int. Cl.³ G03H 1/02, 1/28
U.S. Cl. 350—3.61 **6 Claims**

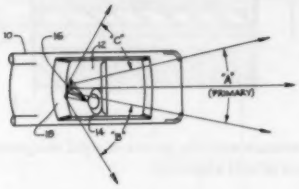


1. A multiple bulk optical holographic storage device, comprising:
- a thick photosensitive electro-optical material capable of storing information by the photovoltaic effect, and having reference and object faces forming a right angle;
- a source of monochromatic light;
- means for splitting the monochromatic light into first and second beams;
- means for forming the first beam into a collimated reference beam impinging onto the reference face with a variable optical axis with respect thereto;
- a convergent optical element;
- means for passing the second beam through the convergent optical element to form an object beam impinging on the object face without any zero-order stop;
- means interposed between the convergent optical element and the object face for modulating the object beam with information to be recorded within the electro-optical material, the modulated object and reference beams interfering within the material so as to be recorded as variations in refractive index within the material; and
- transparent electrodes attached to all of the faces of said material and electrically short circuited to one another so as to maintain a zero electrical potential difference therebetween to prevent elementary storage zones of said material from tending toward saturation after several successive storage operations.

4,449,786
REARVIEW MIRROR

Robert C. McCord, 6220 Burton, Romulus, Mich. 48174

Continuation-in-part of Ser. No. 916,598, Jun. 19, 1978, Pat. No. 4,264,144. This application Apr. 24, 1981, Ser. No. 257,490
Int. Cl.³ G02B 5/10
U.S. Cl. 350—293 33 Claims



1. A mirror having a viewing surface with a curvature substantially in accordance with the following mathematical relationship, expressed in incremental field angular relationships:

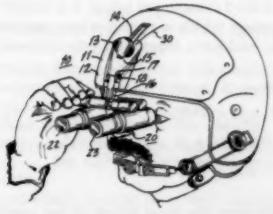
$$\Delta\delta_n = \Delta\delta_{(n-1)}[1+X]$$

in which (n) defines the point of interest along a substantially horizontal line of the mirror's surface, beginning at the optical design axis at which point the line of sight of an observer located substantially in the normal operator's position with respect to the mirror is reflected straight rearward with respect to the vehicle's forward direction; or beginning at the interface with a primary viewing surface, wherein: (n−1) defines the point of interest immediately preceding (n); δ_n defines the accumulated field angle from the optical design axis of the mirror, or from the interface with a primary viewing surface, to the point of interest (n); $\Delta\delta_n$ defines the incremental field angle between (n) and (n−1); X is the constant factor generating a constant rate of horizontal optical distortion with respect to $\Delta\delta_{(n-1)}$, which is chosen to produce a desired total field of view across the variable-radius surface, all other factors remaining unchanged; and $\Delta\theta$ is the constant vision angle increment to which all $\Delta\delta_n$ values are related.

4,449,787
NIGHT VISION IMAGING SYSTEM ADAPTED FOR HELMET MOUNTING

James H. Burbo; Louis P. Hartman, both of Roanoke, Va.; Douglas M. Spranger, New York, N.Y.; Malcolm J. Brookes, New York, N.Y., and Paul J. Mulhauser, New York, N.Y., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Continuation of Ser. No. 171,223, Jul. 22, 1980, abandoned. This application Mar. 22, 1982, Ser. No. 360,727
Int. Cl.³ G02B 23/12
U.S. Cl. 350—538 25 Claims



1. A night vision imaging apparatus for mounting on a helmet comprising:

a helmet mount assembly secured to said helmet at a front surface above the position of the eyes of a user when said helmet is being worn, said assembly containing a first pivot receptacle positioned on said assembly closest to the eyes of said user,

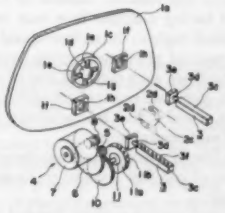
an image intensifier assembly having a first and a second tubular housing each containing a night vision imaging optical system and spaced apart according to the separation of the eyes of said user, said assembly including a central support arm centrally positioned between said tubular housings and having a second pivot means for engaging said first pivot receptacle and including locking means for enabling said intensifier assembly to be "flipped-up" and locked in position away from the eyes of said user and to maintain said position and to be "flipped-down" by said user from said locked position to cause said tubular housings to be respectively positioned in front of said user's eyes,

said first pivot receptacle comprising a "U" shaped receptacle, and said second pivot means comprising a pivot rod coupled to the top of said central support arm and transverse thereto for coacting with said "U" shaped receptacle, and at least one locking shoulder positioned beneath said rod and adapted to coact with said "U" shaped receptacle when said intensifier assembly is positioned in the "flipped-up" mode.

4,449,788
MAGNETIC ANGLE ADJUSTING ARRANGEMENT FOR MIRROR OF MOTOR VEHICLE

Masaru Suzuki, Chiryu, Japan, assignor to Kabushiki Kaisha Tokai Rika Denki Seisakusho, Aichi, Japan

Filed Mar. 16, 1982, Ser. No. 358,795
Claims priority, application Japan, Mar. 31, 1981, 56-47525[U]
Int. Cl.³ G02B 5/08; F16H 13/12
U.S. Cl. 350—289 6 Claims



1. An angle adjusting arrangement for mirror of a motor vehicle and the like, comprising: a mirror case; a mirror in said mirror case; a casing which is fixedly provided within said mirror case at a position behind a mirror; a back cover member supporting the mirror; means pivotally connecting the central portion of the rear face thereof to said casing; mirror push-pull control shafts each loosely connected, at corresponding ends thereof, to the back cover member, at an upper or lower side, and at a right or left side with respect to said central pivotal connection of the back cover member; and driving mechanisms coupled to the other ends of said push-pull control shafts for selective advancing and retraction of said mirror push-pull control shafts in the axial direction thereof, each of said push-pull control shafts including a main portion which is made of magnetic material and which has its one surface alternately magnetized in N and S poles in the longitudinal direction thereof, each of said driving mechanisms having an operating plate provided with a peripheral surface made of magnetic material, and connected for rotation to said driving mechanism and confronting said magnetized surface of said push-pull control shaft, said operating plate having said peripheral surface alternately magnetized in N and S poles so as to correspond to said magnetized surface of said push-pull control shaft

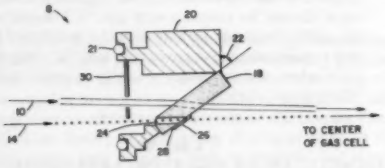
for magnetic coupling between said operating plate and said push-pull control shaft.

4,449,789

VACUUM TIGHT WINDOW THROUGH WHICH A HIGH POWER LASER BEAM AND A HIGH ENERGY PARTICLE BEAM CAN BE TRANSMITTED WITHIN CLOSE PROXIMITY TO EACH OTHER

Wayne D. Kimura, Seattle, Wash., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 9, 1982, Ser. No. 416,526
Int. Cl.³ G02B *27/00*
U.S. Cl. 350—319 **9 Claims**



1. A vacuum-tight window for installation in a gas cell through which a high-power laser beam and a high-energy particle beam can be transmitted within close proximity to each other comprising:

(a) a cylindrical holding block having a central bore along its longitudinal axis aligned parallel to the longitudinal axis of said gas cell, said holding block positioned and sealed within said gas cell by at least one O-ring;

(b) a disc of a first material capable of transmitting laser beams and having a drilled hole near its perimeter at a predetermined angle to the surface of said disc, said disc of said first material positioned within said central bore of said holding block such that said disc of said first material completely spans said central bore and such that the longitudinal axis of said drilled hole is parallel to said longitudinal axis of said central bore;

(c) a circular film of a second material about said drilled hole on said disc of said first material on its surface internal to said gas cell;

(d) a disc of said second material bonded over said drilled hole and within said circular film pattern; and

(e) a disc of a third material bonded to said disc of said second material and to said circular film of said second material, said disc of said third material having a thin film of said second material about its rim completely touching said circular film on said disc of said first material.

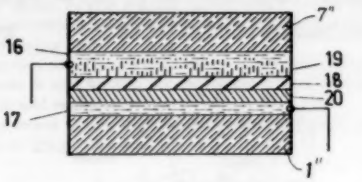
4,449,790

ELECTROCHROMIC LAYER SYSTEM

Werner Thöni, Maienfeld, Switzerland, assignor to Balzers Aktiengesellschaft, Liechtenstein

Filed Jun. 23, 1981, Ser. No. 276,490
Claims priority, application Switzerland, Jul. 7, 1980, 5183/80
Int. Cl.³ G02F *1/17*
U.S. Cl. 350—357 **12 Claims**

1. An electrochromic layer system, comprising a pair of spaced apart electrodes, a layer of an electrochromic material between said electrodes, at least one additional layer having a matrix of solid inorganic substance acting as a carrier of an electrolyte arranged on said electrochromic material layer between said material layer and one of said electrodes, at least one additional layer being transparent, and free atoms of a polyvalent metal embedded between said at least one additional layer and the one of said electrodes forming a finely



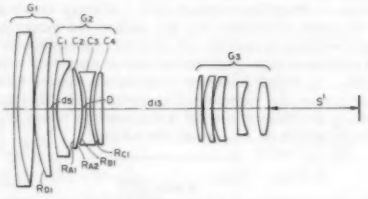
dispersed mixture with the matrix of solid inorganic substance near the one of said electrodes.

4,449,791

THREE-GROUP ZOOM LENS

Hidenori Terasawa, Kawasaki, and Kiyoshi Hayashi, Yokohama, both of Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan

Filed Aug. 14, 1981, Ser. No. 292,436
Claims priority, application Japan, Aug. 22, 1980, 55-115373
Int. Cl.³ G02B *15/16*
U.S. Cl. 350—427 **10 Claims**



1. A three-group zoom lens having, in succession from a remoter imaging conjugate plane side, a convergent first group, a divergent second group and a convergent third group and in which by moving said second group and said third group in different manners of movement, the focal length of the entire system can be varied while maintaining the image plane constant, characterized in that said second group has, in succession from said first group side, a first component including at least one negative meniscus lens having its convex surface facing said first group, a second component which is a positive meniscus lens having its concave surface facing said first group, a third component which is a negative lens, and a fourth component which is a positive lens, and further characterized in that said zoom lens satisfies the following conditions:

$$|1.5f_{II}| < f_A < |4.0f_{II}| \quad (1)$$

$$-5.0 < \frac{R_{A2} + R_{A1}}{R_{A2} - R_{A1}} < -1.5 \quad (2)$$

where f_A represents the focal length of the positive meniscus lens which is the second component, R_{A1} represents the radius of curvature of the surface of said second component which is adjacent to said first group, R_{A2} represents the radius of curvature of the surface of said second component which is adjacent to said third group, and f_{II} represents the combined focal length of said second group.

4,449,792

LARGE-APERTURE SINGLE LENS WITH ASPHERICAL SURFACES

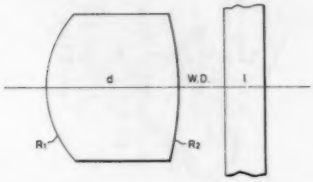
Norikazu Arai, Komae; Shozo Ishiyama, and Tadashi Kojima, both of Hino, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Oct. 30, 1981, Ser. No. 316,863

Claims priority, application Japan, Oct. 31, 1980, 55-152158

Int. Cl.³ G02B *13/08*

U.S. Cl. 350—432 **6 Claims**



1. A large-aperture single lens with aspherical surfaces having both of a first surface and second surface formed as aspherical surfaces having positive refractive powers, said single lens with aspherical surfaces satisfying the following conditions:

$$1 < \frac{R_1}{(n-1)f} < 1.7$$

$$-3 < k_1 < 0$$

where,

R_1: Radius of curvature of first surface ($=1/c_1$)

k_1: Coefficient of cone of first surface

f: Focal length of lens

n: Refractive index of lens

when said aspherical surfaces are expressed by the following formula:

$$x = \frac{ch^2}{1+\sqrt{1-(1+k)c^2h^2}} + \sum_{i=2} A_{2i}h^{2i}$$

where,

x: Distance of point on aspherical surface at height h from optical axis from tangential plane at apex of aspherical surface

h: Height from optical axis

c: Curvature at apex of aspherical surface ($=1/R$)

k: Constant of cone

A_{2i}: Coefficient of aspherical surface of 2ith order (i represents an integer of 2 or over).

4,449,793

INVERTED TELEPHOTO TYPE WIDE ANGLE LENS SYSTEM

Akiyoshi Nakamura, Sakai, and Hisashi Tokumaru, Osaka, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Higashi, Japan

Filed Jul. 30, 1981, Ser. No. 288,286

Claims priority, application Japan, Aug. 12, 1980, 55-111352

Int. Cl.³ G02B *13/04*

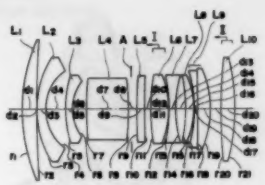
U.S. Cl. 350—458 **19 Claims**

1. An inverted telephoto type wide angle lens system comprising:

an aperture stop;

a first lens group located at the object side of the aperture stop; and

a second lens group located at the image side of the aperture stop, the second lens group including at least two movable focusing lens units with at least one variable air space being located between the two movable focusing lens units, the focusing being practiced by only the movement



of the focusing lens units to cause a change in the variable air space, said system including other lens units which remain stationary.

4,449,794

IMAGING OPTICAL SYSTEM

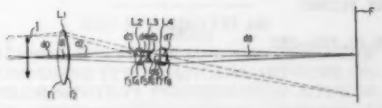
Kenji Yamada, Yokohama, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed Nov. 25, 1981, Ser. No. 324,989

Claims priority, application Japan, Dec. 10, 1980, 55-173122

Int. Cl.³ G02B *9/34*

U.S. Cl. 350—472 **5 Claims**



1. An imaging optical system for photographing an object or a subtantially flat object image at a short distance, including, in succession from the object side, a first positive lens for converging light rays from the object or the substantially flat object image, a second positive lens having of meniscus shape convex toward the object side and disposed with a great air space from said first positive lens, a biconcave negative lens having its surface of sharper curvature on the image side, and a third positive lens having its surface of sharper curvature facing the image side.

4,449,795

STEREOSCOPE WITH TONGUE AND GROOVES

Toshikatsu Yamada, Tokyo, Japan, assignor to k. k. Yamada Kogaku Seisakusho, Tokyo, Japan

Filed Dec. 30, 1981, Ser. No. 335,929

Claims priority, application Japan, Aug. 21, 1981, 56-124536[U]; Aug. 21, 1981, 56-124535[U]

Int. Cl.³ G02B *21/22, 27/02*

U.S. Cl. 350—516 **3 Claims**

1. A stereoscope comprising:

a. a frame;

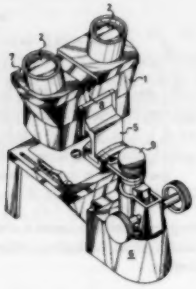
b. an objective lens having an optical axis, said objective lens being mounted in said frame;

c. a pair of eye pieces each having an optical axis which intersect said objective lens at points laterally spaced from its optical axis;

d. a pair of carriers, one for each of said eye pieces; and

e. tongue and grooves included on the said frame and carriers for mounting said carriers on said frame and for mov-

ing said carriers relative to said frame to adjust the distance between the optical axis of said eye pieces and their



points of insection with said objective lens relative to its optical axis.

4,449,796

STREAMLINED ADJUSTABLE EXTERIOR REARVIEW MIRROR

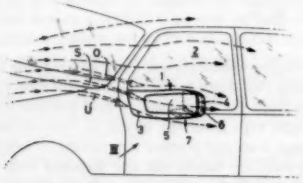
Lutz J. Janssen, Munich, and Patrick Le Quement, Cologne, both of Fed. Rep. of Germany, assignors to Ford Motor Company, Dearborn, Mich.

Filed Jul. 26, 1982, Ser. No. 401,448

Claims priority, application Fed. Rep. of Germany, Aug. 17, 1981, 3132400

Int. Cl.³ G02B *5/08, 7/18*

U.S. Cl. 350—582 **2 Claims**



1. An exterior rear-view mirror for motor vehicles, having a streamlined housing including a mirror adjustable therein, and wherein the flow around the rear-view mirror is improved by air-guide devices located on the housing in the form of air-guide surfaces, characterized in that the streamlined housing is arranged to rest against the front side window and consists of a fixed housing part circumscribing the mirror and of a movable housing part adjoining said fixed housing part and carrying the mirror, the fixed housing part being provided, at least in its lower region, with an air-guide surface, and the movable housing part having a drawn-in outer contour and the air-guide surface being arranged to prevent air flow separation from this outer contour.

4,449,797

BINOCULAR OPHTHALMOSCOPE

Jakob Kocher, Wiesenweg 19, 7401 Dusslingen, and Michael Foerster, Borbeck 23, 4300 Essen 16, both of Fed. Rep. of Germany

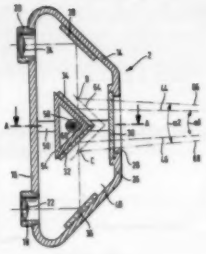
Filed May 19, 1981, Ser. No. 265,121

Claims priority, application Fed. Rep. of Germany, May 31, 1980, 3020750

Int. Cl.³ A61B *3/10*

U.S. Cl. 351—205 **9 Claims**

1. In a binocular ophthalmoscope for indirect observation of an eye to be examined, the ophthalmoscope having an observation unit, an illumination unit, means for connecting said observation unit to said illumination unit, and means including means for mounting two mirrors in a wedge in said observation unit for reflecting two observation beams from said eye to be examined respectively to the eyes of the observer, said observation beams defining an observation plane, and wherein said illumination unit includes a light source and at least one mirror



for directing the light from said light source along an illumination beam to said eye to be examined, the improvement comprising: means for enabling displacement of said means for mounting said two mirrors within said observation unit in said observation plane towards and away form said eyes of said observer and means for enabling movement of said illumination beam towards and away from said observation plane.

4,449,798

EYE FUNDUS OBSERVATION APPARATUS

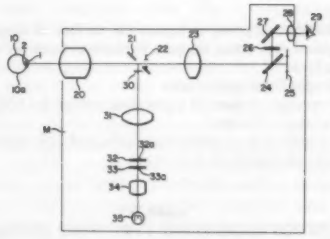
Masao Nohda, Yokosuka, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed Mar. 2, 1982, Ser. No. 353,910

Claims priority, application Japan, Mar. 27, 1981, 56-44122

Int. Cl.³ A61B *3/14;* G03B *29/00*

U.S. Cl. 351—207 **6 Claims**



1. In an eye fundus observation apparatus wherein light-intercepting members for eliminating flare are provided at predetermined positions in an illumination optical path which are substantially conjugate with the cornea and the front surface of the crystalline lens of an eye being examined in a condition in which said apparatus is focused to the fundus of the eye, the improvement comprising:

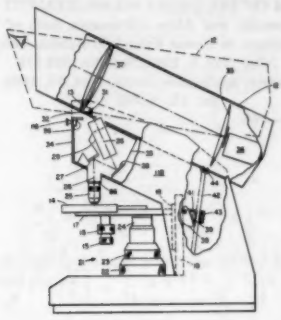
an observation opening formed at a position substantially conjugate with a position between the cornea and the front surface of the crystalline lens of the eye whereat the magnification of the reflected image on the rear surface of the crystalline lens is approximately one-to-one magnification in a condition in which said apparatus is focused to the fundus of the eye.

4,449,799

OPTICAL PROJECTION VIEWING SYSTEM

Roger S. Turner, 620 Carpenter La., Philadelphia, Pa. 19119

Filed May 20, 1982, Ser. No. 380,107
Int. Cl.³ G02B *21/36*
U.S. Cl. 353—39 **25 Claims**



1. An optical projection viewing system comprising:
a fixed base,
an object supporting work station,
a viewing housing,
a viewing screen fixed in said housing for displaying a projected image thereon,
said viewing housing being mounted for pivotal movement relative to said base on pivot means remote from said viewing screen to provide vertical arcuate displacement of said viewing screen and height adjustment for a person viewing said screen,
an optical system comprising a projection lens and an objective lens mounted intermediate said viewing screen and said work station,
light bending means pivotally mounted on a fixed axis at a fixed distance from said viewing screen and said objective lens,
said light bending means further comprising adjusting means for maintaining the optical path of said viewing system relatively unchanged with respect to said viewing housing, and
said pivot means being remote from said viewing screen and intermediate said base and said viewing housing for pivoting said viewing housing to provide said vertical height adjustment of said viewing screen.

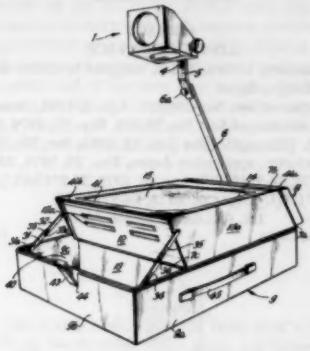
4,449,800

PORTABLE OVERHEAD PROJECTOR

Vincent E. De Longis, Yonkers, N.Y., and Henry Kyhl, Leonia, N.J., assignors to buhl Industries, Inc., Hawthorne, N.J.

Filed Jan. 26, 1983, Ser. No. 461,164
Int. Cl.³ G03B *21/30*
U.S. Cl. 353—119 **10 Claims**

1. A portable overhead projector comprising:
a housing having an open top, a first side wall, a second side wall, a third side wall, and a fourth side wall, said sidewalls defining said housing, said first side wall and said second side wall being opposite each other, and said third side wall and said fourth side wall being opposite each other;
a projecting lamp disposed in the housing;
a planar lens;
lens mounting means for mounting the lens on the housing for pivotal movement from a storage position wherein the lens is adjacent the open top of the housing to an operative position wherein the lens is spaced above the open top of the housing and the projecting lamp, said lens mounting means including a rectangular lens frame, a first member hingedly connected to one edge of the frame and to the upper portion of the first side wall, and a second said member hingedly connected to the opposite edge of the frame and to said housing at a point spaced from said second side wall;
a projector head assembly;



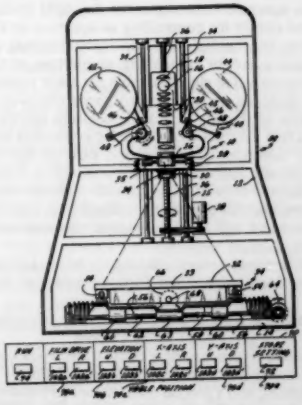
projector mounting means for operationally mounting the projector head assembly on the housing when the lens is in the operative position to dispose the projector head assembly thereabove; and
a cover connectable to the housing for covering the lens when in the storage position.

4,449,801

METHOD AND PROJECTING TYPOSITOR FOR COMPOSING TYPOGRAPHICAL ARTWORK ON COLOR SENSITIVE PHOTOGRAPHIC MEDIUM

John W. Millerburg, 2057 Castilian Dr., Hollywood, Calif. 90068

Filed May 21, 1982, Ser. No. 380,782
Int. Cl.³ B41B *13/00*
U.S. Cl. 354—12 **14 Claims**



1. A method of composing a typographical layout on a color sensitive photographic medium comprising the steps of:
projecting the image of a selected type character onto a projection surface;
positioning the projected image at a selected location on the projection surface;
repeating said projecting and positioning steps to visually compose a desired typographical layout;

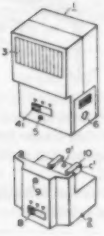
recording the identity and position of each projected type character in the composed layout;
placing a color sensitive photographic material onto said projection surface; and
duplicating the recorded composition on said color sensitive photographic material.

4,449,802

ADAPTER DEVICE

Zenzo Nakamura, Urawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 250,281, Apr. 2, 1981, abandoned, which is a division of Ser. No. 79,598, Sep. 27, 1979, Pat. No. 4,315,679. This application Jun. 21, 1983, Ser. No. 505,024
Claims priority, application Japan, Dec. 25, 1978, 53-163545; Apr. 28, 1979, 54-57153[U]; Apr. 28, 1979, 54-57154[U]; Apr. 28, 1979, 54-57155[U]; Apr. 28, 1979, 54-57156[U]
Int. Cl.³ G03B *7/099, 15/05*
U.S. Cl. 354—416 **16 Claims**



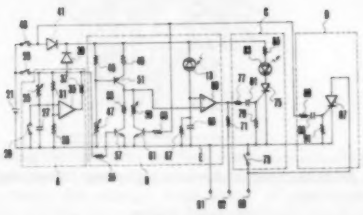
1. An adapter device for use with a light adjusting flash device and a camera, said flash device having charge completion signal forming means for putting out a charge completion signal when the charge level of a capacitor for flashlight emission reaches a predetermined value, and having light adjusting circuit means for stopping the flashlight emission when the quantity of light reflected from an object and received by a light receiving element reaches a predetermined level, and said camera having a day-light aperture signal forming circuit for forming an aperture value signal for day-light mode, an aperture control circuit for controlling an aperture on the basis of a signal from the day-light aperture signal forming circuit in a day-light mode and for controlling an aperture on the basis of a flash aperture value signal suitable for flash photography in flashlight mode, an aperture control mode selection circuit for selecting one of the day-light and flashlight modes, a ground terminal, a first external terminal being connected to said aperture mode selection circuit, second external terminal being connected to said aperture control circuit, and a voltage source being connected between said ground terminal and said first external terminal, for applying a voltage to at least one of said aperture control and mode selection circuits; said adapter device comprising:
(a) first terminal means adapted to be connected to said charge completion signal forming means in the flash device;
(b) second terminal means adapted to be connected to said mode selection circuit in the camera;
(c) transistor means having a control electrode connected to said first terminal means, a first main electrode connected to a ground and a second main electrode connected to said second terminal means, said transistor means being turned on in response to an application of said charge completion signal to said control electrode to change the electrical condition at said second terminal means to operate said mode selecting circuit so that it selects the flashlight mode selection;
(d) flashlight aperture signal forming means for forming said flash aperture value signal; and
(e) third terminal means connected to said flashlight aperture signal forming means and adapted to be connected to said second external terminal for transmitting said flash aperture value signal to said aperture control circuit.

4,449,803

INDICATING APPARATUS FOR ELECTRONIC FLASH SYSTEM OF TTL LIGHT MEASUREMENT TYPE

Masanori Yamada, and Akira Hiramatsu, both of Kanagawa, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 9, 1981, Ser. No. 319,618
Claims priority, application Japan, Nov. 13, 1980, 55-159906
Int. Cl.³ G03B *7/16*
U.S. Cl. 354—416 **8 Claims**



5. An annunciating apparatus for use with an electronic flash system, said flash system including trigger means for generating a trigger signal at a time of test light emission, and a light producing means responsive to the trigger signal for initiating the operation of said light producing means whereby light is emitted therefrom, said annunciating apparatus comprising:
(a) light sensitive means arranged to receive light passed through the photographic taking lens and being operative to produce a first electrical signal corresponding to an amount of light from said scene;
(b) signal generating means for producing a second electrical signal corresponding to an aperture value preset on a camera at the time of test light emission for said electronic flash system;
(c) comparison means for receiving said first and second electrical signals and for producing a control signal when said first electrical signal has reached a predetermined level;
(d) light terminating means responsive to said control signal for initiating the operation of said light terminating means whereby said emitted light is terminated; and
(e) annunciating means responsive to said control signal and for annunciating whether a correct exposure obtains.

4,449,804

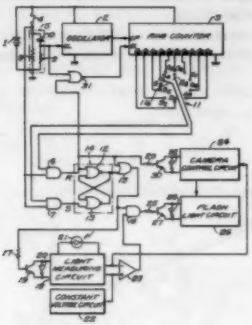
INTERVAL TIMER DEVICE

Yoshitaka Watanabe, Tokyo, and Jiro Kazumi, Kanagawa, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 24, 1982, Ser. No. 381,561
Claims priority, application Japan, May 23, 1981, 56-78398
Int. Cl.³ G03B *15/05, 17/40*
U.S. Cl. 354—418 **5 Claims**

2. A photographic system comprising:
(a) interval timer for producing a first signal with a certain interval and producing a second signal with a certain time delay after said first signal is produced;
(b) flash device having a main capacitor, a flash means and a charging means for charging the main capacitor;
(c) photographic operation control means for performing photographic operation in response to said second signal; and
(d) detecting means for detecting an intensity level of object light and producing a signal when the intensity level is

lower than the predetermined level, said charging means becomes operative and performing the operation in response to said first signal when the detecting means produces said signal.



4,449,805

DATA REGISTRATION DEVICE

Nobuaki Sakurada, Yokohama; Masaharu Kawamura, Tokyo; Shohei Ohtaki, Yokohama; Soichi Nakamoto, Tokyo, and Nobuhiko Shinoda, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

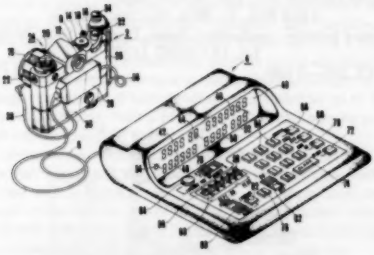
Continuation of Ser. No. 896,614, Apr. 14, 1978, Pat. No. 4,169,186, which is a continuation of Ser. No. 789,838, Apr. 22, 1977, abandoned, which is a continuation of Ser. No. 650,900, Jan. 21, 1976, abandoned. This application Jul. 20, 1981, Ser. No. 285,433

Claims priority, application Japan, Jan. 24, 1975, 50-10284

The portion of the term of this patent subsequent to May 24, 2000, has been disclaimed.

Int. Cl.[3] G03B *17/24*

U.S. Cl. 354—105 7 Claims



1. For a camera with a release and defining a film recording location, a camera data recording system, comprising:

(a) ten-key means to set numerical information,

(b) blank information setting means to set blank space information,

(c) a memory circuit for memorizing the numerical information and the blank information, said memory circuit having a plurality of memory portions,

(d) a light emitting display circuit for directing the numerical information memorized in said memory circuit toward the recording location,

said display circuit having a plurality of alpha-numeric display elements which can emit light for displaying the numerical information with a plurality of digits, each of the display elements being arranged to display numerical information memorized in a prescribed memory portion, and

(e) a control circuit having a programming portion containing a program for controlling the recording of data, said program containing an instruction to have the numerical information and the blank space information memorized in prescribed memory portions in sequence as the ten-key means and the blank information setting means are operated, and an instruction to have the numerical information recorded on the recording surface with the numerical information memorized in each memory portion displayed by a prescribed alpha-numeric display element designated by each memory portion in response to a release action of the camera and, at the same time, to have the blank space information prevent the display element assigned to the memory portion in which said blank space information is memorized from performing a light emitting operation.

4,449,806

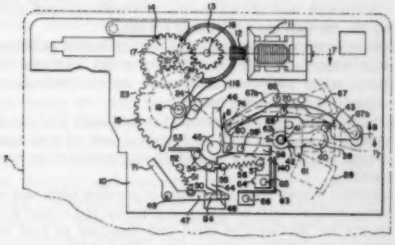
FILM ADVANCE MECHANISM FOR DISC CAMERA

Wan C. Wong, North Point, Hong Kong, and Shigeru Oshima, Tokyo, Japan, assignors to W. Haking Enterprises Limited, Hong Kong, Hong Kong

Filed Jun. 1, 1983, Ser. No. 499,906

Int. Cl.[3] G03B *1/00, 19/02*

U.S. Cl. 354—121 14 Claims



1. In an electrically driven still camera having a housing with a film chamber defined in part by a rear film chamber wall having a projecting hub support adapted to received a disc film cassette, said film cassette comprising a thin housing with an exposure window and having a film disc rotatable therein, said film disc having a central hub portion with a generally circular aperture to fit over said hub support and an eccentrically disposed slot, said film disc having a peripheral notch opposite each film frame, and motor drive means disposed within said housing for rotatingly advancing said film disc to present successive frames thereof for exposure in said window to image-forming light, the improvement wherein said hub support on the outer face of said rear chamber wall forms a stationary or non-driven pivot support for said film disc hub portion and there is provided in said housing a film disc driving member driven by said motor drive means and having a portion for engaging one of said peripheral notches of said film disc and advancing said film disc one frame distance after each frame exposure; and sensing means on the portion of said rear chamber wall disposed opposite said eccentric film disc hub slot for detecting the presence of said film disc slot only after the last frame of said film disc has been moved opposite said exposure window; and control means responsive to said sensing means for detecting the presence of said hub disc slot and disabling said motor means so as to prevent further film advancement when said eccentric slot is advanced to a position indicative of an end-of-film condition.

4,449,807

AUTOMATIC SYSTEM AND INTERCHANGEABLE OPTICAL INSTRUMENT THEREFOR

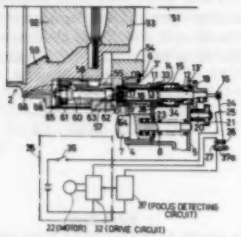
Yukio Miki, and Takeshi Egawa, both of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Apr. 7, 1982, Ser. No. 366,323

Claims priority, application Japan, Apr. 18, 1981, 56-58976; Apr. 23, 1981, 56-61938; Apr. 24, 1981, 56-63103

Int. Cl.³ G03B *3/00*

U.S. Cl. 354—195.1 **22 Claims**



1. An optical apparatus employing an automatic focusing system comprising:

an optical instrument main body having driving means for automatic focusing operation;

an interchangeable optical instrument releasably mounted on said main body and having an optical system defining an optical axis and driven means driveable by said driving means for moving the optical system;

position restricting means for restricting mutual positions of said interchangeable optical instrument and said main body when said interchangeable optical instrument is mounted on said main body;

a rotatable driving shaft provided in said main body so as to extend in parallel with said optical axis of said optical system and connected to said driving means to be rotated thereby;

a rotatable driven shaft extending in parallel with said optical axis of said optical system and connected to said driven means for driving the same and disposed in said interchangeable optical instrument to align with said driving shaft when said interchangeable optical instrument is mounted on said main body;

clutch portions provided on respective end faces of said driving shaft and said driven shaft confronting each other so as to be connected with each other;

supporting means for supporting said driving shaft movably between a connecting position where said clutch portions are connected with each other and a disconnecting position where said clutch portions are disconnected from each other;

urging means for urging said driving shaft to said connecting position when said interchangeable optical instrument is mounted on said main body; and

manual operating means operable for moving said driving shaft to said disconnecting position.

4,449,808

ELECTROSTATIC DETACK APPARATUS AND METHOD

Cristian O. Abreu, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Jun. 7, 1982, Ser. No. 385,624

Int. Cl.³ G03G *15/00*

U.S. Cl. 355—3 TR **4 Claims**

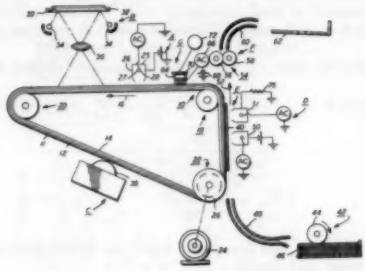
1. In a xerographic reproduction machine, apparatus for partially neutralizing charge on the backside of a copy sheet electrostically adhered to a photoconductive surface, said apparatus comprising:

a dicorotron electrode including a conductive wire having an insulative outer coating, said coating being sufficiently thick that with an a.c. voltage applied to said conductive wire there is substantially no net d.c. current flow from the wire in the absence of an external electrostatic field;

a conductive shield;

a resistor operatively connecting said shield to ground; and

means for moving said copy sheet with charge on its backside past said dicorotron electrode whereby an external electrostatic field is established between said conductive shield and said copy sheet thereby causing a net d.c. current to flow from said dicorotron electrode to said copy sheet and through said resistor via said shield whereby the voltage drop across said resistor provides a suitable bias voltage for said shield.



4,449,809

DRIVE UNIT MOUNTING MECHANISM FOR REPRODUCING APPARATUS

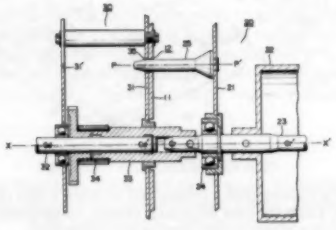
Takashi Tamura, Higashimine, Japan, assignor to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Dec. 21, 1982, Ser. No. 451,820

Claims priority, application Japan, Dec. 28, 1981, 56-197905

Int. Cl.³ G03G *15/00*

U.S. Cl. 355—3 DR **3 Claims**



1. In a reproducing apparatus having a machine frame, a drive unit provided at one side of said machine frame and a driven member provided at the other side of said machine frame, a drive unit mounting mechanism comprising: a drive shaft projected from said drive unit through said machine frame and adapted to drive said driven member; an insertion pin projected from a carrier for carrying said driven member and insertion holes formed in said machine frame and in said drive unit so as to receive said insertion pin when said carrier is mounted on said machine frame to connect said drive shaft and said driven member with said drive unit correctly aligned with said machine frame.

4,449,810

ELECTROPHOTOGRAPHIC COPYING MACHINE WITH MEANS FOR MIXING AND REMOVING TONER AND AN INTEGRAL EXPOSURE PLATE

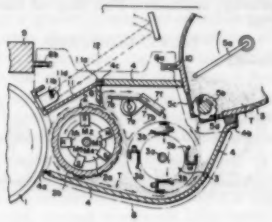
Masumi Ikesue, Tokyo, and Nobuyuki Yanagawa, Chigasaki, both of Japan, assignors to Ricoh Company, Ltd., Japan

Filed Jul. 12, 1982, Ser. No. 397,229

Claims priority, application Japan, Jul. 10, 1981, 56-107798; Jul. 15, 1981, 56-110353

Int. Cl.³ G03G *15/09*

U.S. Cl. 355—3 DD 10 Claims



1. In a dry type development apparatus comprising (1) a developer container for holding a two-component type toner therein, disposed near a photoconductor on which latent electrostatic images are formed, (2) a developer replenishment tank, (3) a development roller, disposed within said developer container, comprising a rotatable non-magnetic sleeve and inner magnets which are supported stationarily within said non-magnetic sleeve, said nonmagnetic sleeve being in proximity to the peripheral surface of said photoconductor and capable of forming a magnetic brush thereon from which the toner is supplied to the latent electrostatic image-bearing photoconductor for development of the latent images during the rotation of said non-magnetic sleeve, (4) a rotatable bucket wheel disposed near said developer roller in the development container, for supplying the toner to said development roller, which bucket wheel rotates and scoops up the toner which flows from a lower portion of said development roller along the bottom of said development container and supplies the scooped up toner to the development roller, and (5) a doctor blade which is fixed to a stationary portion of the development apparatus and is directed towards the peripheral surface of said non-magnetic sleeve of said development roller so as to form thereon a toner layer with a predetermined thickness by scraping the excess toner off said toner layer,

the improvement wherein said development roller and said bucket wheel are rotated in the same direction, and the toner which flows from the lower portion of said developer roller to the lower buckets of said bucket wheel is carried upwards by said bucket wheel towards the upper portion of said development roller,

and wherein said apparatus further comprises a separator which is disposed near to, but spaced apart from, said doctor blade and extends over said bucket wheel for guiding the toner scrapped off by said doctor blade away from the development roller onto said bucket wheel or to said developer container, and said doctor blade is disposed with a positive rake angle with respect to the perpendicular to the tangent to said development roller at a point of nearcontact therewith midway between a pair of inner magnets of said development roller,

whereby the toner scraped off the toner layer by said doctor blade is carried onto said separator, and is returned onto said bucket wheel or to said development container, and, in the meantime, the toner deposited in the form of a toner layer on said development roller is carried to a development section of said photoconductor for development of latent electrostatic images formed on said photoconductor, and the excess toner which is not used for the development is carried below said development roller and is then carried along the bottom of said developer container towards said bucket wheel.

4,449,811

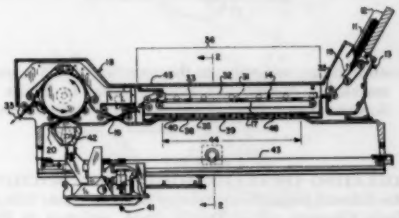
PLATEN COVER

Frank A. Betron, Plano; James W. Davis, Richardson; Barry C. Kockler, Lewisville, and Lonnie K. Spears, Murphy, all of Tex., assignors to The Mead Corporation, Dayton, Ohio

Filed Mar. 8, 1982, Ser. No. 355,975

Int. Cl.³ G03G *15/00*

U.S. Cl. 355—3 SH 9 Claims



1. In a copying machine comprising a frame, a platen mounted on said frame for exposing bulky documents, a scan station mounted on said frame separate from said platen for exposing sheet-type documents, sheet transport means for transporting said sheet-type documents to said scan station, a platen cover for covering said platen, means pivotally mounting said platen cover on said frame, and counter-balancing means acting between said frame and said platen cover for aiding in the lifting of said platen cover; the improvement wherein said means mounting said platen cover pivots along an axis parallel to the direction of movement of sheet-type documents through said transport means, said transport means includes a plurality of transport belts and pressure means for holding said sheet-type documents against said belts during their movement through said transport means, said transport means is mounted within said platen cover and is covered by a lid which is detachably latched within said platen cover and which is pivotally attached to said frame for pivotal movement about the same axis as said cover for opening while said platen cover is closed and, linkage means mounted between said platen and said cover for supporting said pressure means so that when said lid is pivoted relative to said cover said pressure means is removed from said transport belts for removing jammed documents therefrom.

4,449,812

PAPER LEAF HANDLING APPARATUS

Katsushi Furuichi, and Naomi Takahata, both of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 14, 1981, Ser. No. 311,448

Claims priority, application Japan, Oct. 17, 1980, 55-145272; Oct. 17, 1980, 55-145276; Oct. 17, 1980, 55-145294; Oct. 17, 1980, 55-145298; Dec. 18, 1980, 55-180199

Int. Cl.³ G03G *15/00*

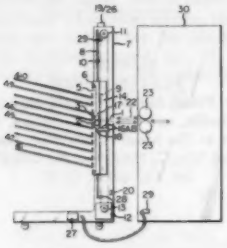
U.S. Cl. 355—14 SH 21 Claims

1. A paper leaf handling apparatus, comprising:

a paper leaf receiving unit having a plurality of trays;

moving means for moving said paper leaf receiving unit upwardly or downwardly, to position said plurality of trays in alignment with a paper leaf carry-out port so that paper leaves are received into said plurality of trays;

means for preventing said plurality of trays from falling; means for releasing said preventing means; and



control means, responsive to the operation of said releasing means, for causing said moving means to initiate the downward movement of said paper leaf receiving unit.

4,449,813

COLLATING APPARATUS FOR COPYING MACHINE

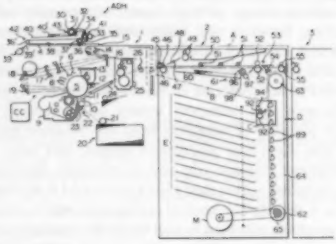
Hideo Kikuchi; Sunao Ikeda; Yohtaro Kakitani; Kunio Hibi, and Tugio Okuzawa, all of Tokyo, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Continuation of Ser. No. 167,993, Jul. 14, 1980, abandoned. This application Jan. 3, 1983, Ser. No. 455,138

Claims priority, application Japan, Jul. 19, 1979, 54-90928; Jul. 31, 1979, 54-97872; Sep. 29, 1979, 54-126002

Int. Cl.³ B65H *7/02*; G03G *15/00*

U.S. Cl. 355—14 R **7 Claims**



1. A collating apparatus including a plurality of bins, deflector means for deflecting sheets into selected bins, feed means for feeding the sheets to the deflector means and discharge sensor means for sensing discharge of sheets from the deflector means into the bins, characterized by comprising:

sheet number storage means for storing a number representing the quantity of sheets to be collated;

discharge counter means for counting a number of sheets discharged into the bins;

comparator means for comparing the number of sheets discharged into the bins with the number of sheets to be collated and producing a next collating operation enable signal when said numbers are equal;

inlet sensor means for sensing entry of sheets into the feed means, inlet counter means for counting a number of sheets which entered the feed means, jam sensor means for sensing a sheet jam and producing a jam signal in response thereto; and

a copying machine for copying a document and feeding the sheets in the form of copies of the document to the feed means, the copying machine comprising copy counter means for counting a number of copies produced, the apparatus further comprising means for directly transferring a count in the discharge counter means which represents the number of sheets discharged into the bins into the copy counter means to constitute a new count in the copy counter means in response to the jam signal.

4,449,814

EXPOSURE DEVICE

Siegfried Theimer, Rohler Strasse 12, D-6484 Obersotzbach, Fed. Rep. of Germany

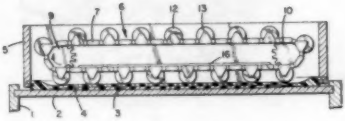
PCT No. PCT/DE82/00118, 371 Date Feb. 4, 1983, 102(e) Date Feb. 4, 1983, PCT Pub. No. WO82/04333, PCT Pub. Date Dec. 9, 1982

PCT Filed Jun. 2, 1982, Ser. No. 466,334

Claims priority, application Fed. Rep. of Germany, Jun. 6, 1981, 3122707

Int. Cl.³ G03B *27/04*

U.S. Cl. 355—85 **11 Claims**



1. An exposure device for the exposure of photosensitive material through a master, comprising a glass plate; a rubber mat having a front side and a rear side and being arranged to be pressed against said glass plate; means for applying negative pressure between said glass plate and said front side of said rubber mat whereby said photosensitive material and said master may be inserted between the glass plate and the front side of said rubber mat and an exposure may be effected through said glass plate, said device further comprising a pressure roll; and means for rolling said pressure roll over the rear side of said rubber mat for smoothing said rubber mat, said rolling means comprising a drive with two endless drive members mounted over the rear side of said rubber mat with said pressure roll extending between and being carried by said endless drive members.

4,449,815

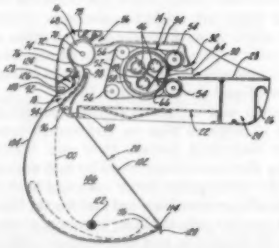
DIAZO COPIER

Hugh J. Staffan, 25525 Koontz, Roseville, Mich. 48066

Filed Jun. 21, 1982, Ser. No. 390,655

Int. Cl.³ G03D *7/00*; G03B *27/30*

U.S. Cl. 355—106 **4 Claims**



1. In a machine for developing light sensitive copy material by contact with ammonia developing gasses having a developer chamber constructed and arranged to contact light sensitvie copy material with ammonia gasses to develop such copy material, a pump driven by an electric motor and constructed and arranged to deliver ammonia gasses to said developer chamber when operated by said electric motor, a degasser passage constructed and arranged for developed copy material to pass through after being contacted with the ammonia devel-

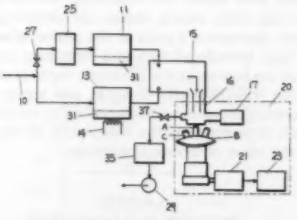
oping gasses, heater means cooperating with said degasser passage and constructed and arranged to heat the developed copy material to an elevated temperature to accelerate the release of ammonia vapor from the copy material, the improvement comprising an enclosed receptacle communicating with said degasser passage and constructed and arranged to receive developed copy material from said degasser passage, said receptacle having an outlet which can be opened and closed and when opened through which developed copy material can be removed from said receptacle, at least one air inlet communicating with the interior of said receptacle, said pump having sufficient capacity when continuously operated by said electric motor to supply a greater quantity of ammonia gasses to said developer chamber than the minimum quantity of ammonia gasses required to develop such copy material, a control device connected with said electric motor, said control device having a variable duty cycle and being constructed and arranged to intermittently operate said electric motor to intermittently drive said pump such that only essentially the minimum quantity of ammonia gasses needed to develop such copy material can be supplied by said pump to said developer chamber, and a blower constructed and arranged to move a stream of air through said inlet, around developed copy material in said receptacle and through at least a portion of said degasser passage adjacent said heater means such that essentially all ammonia is removed from developed copy material received in said receptacle before such developed copy material is removed from said receptacle.

4,449,816

METHOD FOR MEASURING THE NUMBER OF HYPERFINE PARTICLES AND A MEASURING SYSTEM THEREFOR

Yasuo Kohsaka, Sakai; Yoshihiro Nonaka, and Hideo Tachibana, both of Fujiidera, all of Japan, assignors to Nitta Gelatin Kabushiki Kaisha, Osaka, Japan

Filed May 11, 1981, Ser. No. 262,550
Int. Cl.³ G01N *1/00, 15/02*
U.S. Cl. 356—37 **13 Claims**



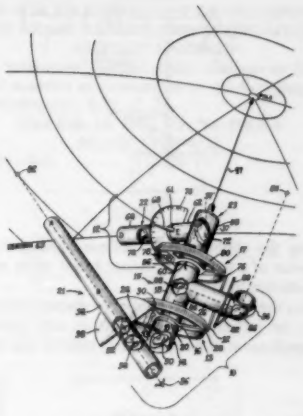
1. A method for measuring the number of hyperfine particles in an aerosol comprising the steps of producing saturated vapor aerosols by dividing an incoming unfiltered aerosol to flow along first and second paths, passing the unfiltered aerosol flowing on said first path through a first vapor chamber saturated with a solvent and at a first temperature, passing the unfiltered aerosol flowing on said second path through a second vapor chamber saturated with the solvent and at a second temperature higher than the first temperature, thereafter delivering the two vapor saturated aerosols to a mixing chamber, so that the vapors are condensed from the resulting supersaturated mixture on the aerosol particles as the nuclei, thereby achieving growth of the aforementioned fine particles, and measuring the number of such fine particles so grown.

4,449,817

CELESTIAL NAVIGATOR

William L. Abler, 3350 S. Michigan Ave., Chicago, Ill. 60616

Filed Mar. 2, 1981, Ser. No. 239,504
The portion of the term of this patent subsequent to Oct. 13, 1998, has been disclaimed.
Int. Cl.³ G01C *1/00, 1/14*; G02B *23/04*
U.S. Cl. 356—145 **10 Claims**



1. A celestial navigation and position locating instrument comprising in operative combination:

(a) a sky assembly having means for simultaneous sighting of two celestial objects and superimposing the images thereof centered on crosshairs in a single field of view, at least one of which celestial objects is viewed by direct sighting;

(i) positions of said celestial objects sighting means being adjustable with respect to each other; and

(ii) the positions of said celestial objects sighting means being settable for Sidereal Hour Angle and Polar Distance for preselected celestial objects; and

(b) a horizon assembly movably secured to said sky assembly and having means for sighting a horizon,

(i) the position of said horizon sighting means being adjustable with respect to said sky assembly so that local latitude and Local Hour Angle of Aries are locatable on setting means associated with said horizon sighting means and said sky assembly, respectively,

(ii) an image of said horizon is visible in an annular region around the central field of view of said celestial objects, and

(iii) said horizon sighting means being adjustable so that a horizon line thereof can be set to coincide with the local horizon.

4,449,818

METHOD OF INSPECTING MICROSCOPIC SURFACE DEFECTS

Kazuo Yamaguchi, Sagamihara; Asahiro Kuni, Nakamachi; Nobuyuki Akiyama, Yokohama, and Juro Endo, Kumagaya, all of Japan, assignors to Hitachi Metals, Ltd., Tokyo, Japan

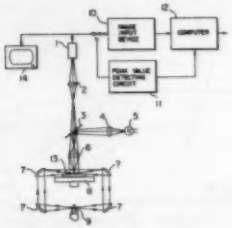
Filed Feb. 9, 1982, Ser. No. 347,248
Claims priority, application Japan, Feb. 10, 1981, 56-17547
Int. Cl.³ G01N *21/00*
U.S. Cl. 356—237 **8 Claims**

1. A method of inspecting defects in the surface of an object to be inspected, comprising:

alternately applying oblique lighting and perpendicular lighting to a location on the surface of the object where a defect or a foreign substance possibly exists;

sensing reflected brightness from said surface of said object during the application of said oblique and perpendicular lighting;

determining the presence of a convex shaped foreign substance at said location on said surface of said object by evaluating the reflected brightness from said location



during the application of oblique lighting to sense the presence of a foreign substance based on its reflection of said oblique lighting; and

detecting the presence of a concave shaped defect by evaluating the reflected brightness from said location during the application of perpendicular light to said location.

4,449,819

ARRANGEMENT FOR DETERMINING THE CONCENTRATION OF A SUBSTANCE IN A MIXTURE OF SUBSTANCES

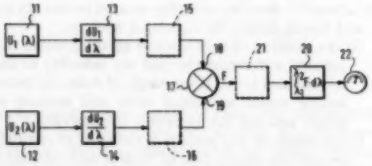
Gerhard Krause, Rosenheim, Fed. Rep. of Germany, assignor to Erwin Sick GmbH Optik-Elektronik, Fed. Rep. of Germany

Filed Jul. 30, 1981, Ser. No. 288,280

Claims priority, application Fed. Rep. of Germany, Aug. 7, 1980, 3029945

Int. Cl.³ G01J *3/00*

U.S. Cl. 356—300 **28 Claims**



1. Apparatus for the generation of a detectable signal related to the concentration of a preselected substance in a mixture of substances from a comparison of the optical spectrum of said mixture over an independent variable with a reference spectrum, said apparatus comprising:

means for storing said reference spectrum or a transformed function thereof, and for generating a signal related thereto,

a detector adapted to detect the optical spectrum of said mixture or a transformed function thereof,

means for suppressing the mean value of at least one of the signals generated by said storing means and said detector,

a controlled transfer stage containing a controlling input, a controlled input and an output, said controlling input adapted to receive the signal generated by said storing means and said controlled input adapted to receive the signal generated by said detector, and

means for integrating the output signal from said controlled transfer stage over said independent variable.

4,449,820

ZEEMAN ATOMIC ABSORPTION SPECTROPHOTOMETER

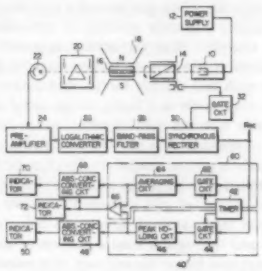
Hideaki Koizumi; Hideo Yamada, both of Katsuta, and Kounosuke Oishi, Mito, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 3, 1981, Ser. No. 299,109

Claims priority, application Japan, Sep. 24, 1980, 55-131617

Int. Cl.³ G01N *21/72*

U.S. Cl. 356—307 **14 Claims**



1. A Zeeman atomic absorption spectrophotometer comprising:

a light source;

an atomizing portion which is irradiated with light from the light source and where a sample is introduced into a chemical flame and atomized;

a detector which receives the light from said light source after it has been absorbed by the atoms in the atomizing portion, and which converts the received light into electric signals;

a magnet which applies the magnetic field to at least either one of said light source or said atomizing portion; and

means for measuring peak values of signals of atomic absorption, which have been corrected for background absorption, while the concentration of sample vapor in the atomizing portion is changing after the sample has been introduced into said atomizing portion, and which measures the concentration of the sample by relying upon the peak values, said means for measuring including means for detecting peak values, means for obtaining a value of atomic absorption signals in the period after the sample has been introduced into said atomizing portion during which the concentration of sample vapor in said atomizing portion remains nearly constant, and means of obtaining concentration values corresponding to atomic absorption signals in response to the magnitudes of the peak values and the value of atomic absorption.

4,449,821

PROCESS COLORIMETER

Jerald D. Lee, Mendenhall, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jul. 14, 1982, Ser. No. 398,385

Int. Cl.³ G01J *3/42*

U.S. Cl. 356—319 **9 Claims**

1. A colorimeter for measuring color of an object comprising:

(a) a single light source that provides a light beam,

(b) a controller electrically connected to the light source,

(c) first beam-shaping optics for collimating and directing the light beam to the object,

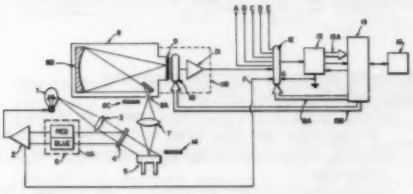
(d) a beam-splitter positioned between the object and the first beam-shaping optics which divides the light beam into a reference and analytical light beam,

(e) blue and red intensity sensors electrically connected to

the controller, which sensors measure the blue and red spectral intensities of the reference light beam incident on these sensors and produce: (1) electrical feedback signals to the controller which maintains the light source at a constant color temperature level; and (2) a color intensity reference signal,

(f) second beam-shaping optics for directing a portion of the analytical light beam that is reflected from the object into a monochromator,

(g) a grating monochromator with an entrance slit through which the reflected portion of the analytical light beam passes,



(h) a detector array which converts the spectra of the light beam dispersed by the monochromator, into discrete individual electrical signals,

(i) a first multiplexer system which receives electrical signals from the detector array and selectively transmits these signals to a second multiplexer,

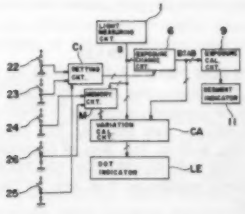
(j) a second multiplexer system which receives the signal from said first multiplexer system and the color intensity reference signal from one of the color intensity sensors to output a signal representing standardized color values of the object measured.

4,449,822

EXPOSURE INDICATOR

Yoshio Yuasa, Kawachinagano, and Kazuhiko Naruse, Sakai, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Nov. 25, 1981, Ser. No. 324,955
Claims priority, application Japan, Nov. 28, 1980, 55-168951
Int. Cl.³ G01J *1/42*
U.S. Cl. 356—227 **22 Claims**



1. An exposure indicator comprising:

light measuring means including a light receiving element for producing an electrical signal as a function of the light received by said light receiving element;

change means for changing the electrical signal obtained from the light measuring means and for producing a changed signal;

setting means provided in association with said change means for setting an amount of change of the electric signal;

first indicator means for indicating a value of an exposure parameter based on said changed signal;

means for determining, based on said amount of change, the density of a photographic sensitized material that is anticipated to be reproduced when a photograph is taken for the measured light with an exposure condition in compliance with the value of the exposure parameter indicated by said first indicator; and

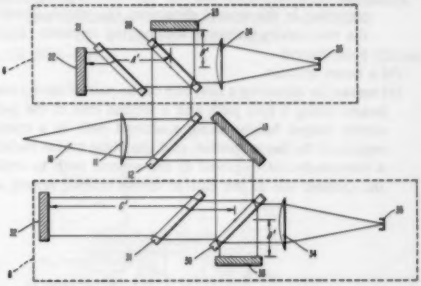
second indicator means for indicating the determined film density.

4,449,823

DEVICE FOR MEASUREMENT OF THE SPECTRAL WIDTH OF NEARLY MONOCHROMATIC SOURCES OF RADIANT ENERGY

Ronald L. Schwiesow, Boulder, Colo., assignor to The United States of America as represented by the Secretary of Commerce, Washington, D.C.

Filed Feb. 12, 1982, Ser. No. 348,575
Int. Cl.³ G01B *9/02*
U.S. Cl. 356—346 **9 Claims**



1. A method of measuring the spectral width of a nearly monochromatic source of radiant energy whose spectral distribution is known or assumed, comprising the steps of:

dividing a beam from said nearly monochromatic source of radiant energy into two separate beams;

supplying each of said separate beams to separate interferometers, said interferometers each having an output which varies in accordance with an optical path difference taken by the beam internal to the interferometer;

adjusting said interferometers such that the optical path difference in one interferometer is different from the optical path difference in the other interferometer; and

deriving said spectral width of said nearly monochromatic source of radiant energy by evaluating the signal transmission from one interferometer with the signal transmission from the other interferometer.

4,449,824

LASER GYRO OUTPUT OPTICS STRUCTURE

James B. Matthews, Wayland, Mass., assignor to Raytheon Company, Lexington, Mass.

Continuation of Ser. No. 200,709, Oct. 27, 1980, abandoned, which is a continuation of Ser. No. 942,106, Sep. 13, 1980, abandoned, which is a continuation of Ser. No. 758,228, Jan. 10, 1977, abandoned. This application Apr. 29, 1983, Ser. No. 489,392
The portion of the term of this patent subsequent to Feb. 17, 1996, has been disclaimed.
Int. Cl.³ G01C *19/64*
U.S. Cl. 356—350 **1 Claim**

1. A laser gyroscope comprising:

(a) a laser gyroscope cavity comprising:

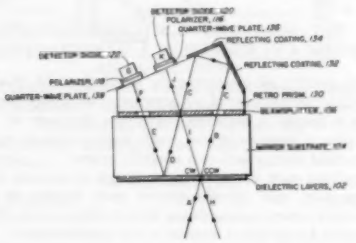
a laser gain medium; and

a polarization dispersive structure for producing two pairs of circularly polarized waves, each one of such waves having a different frequency, such cavity comprising a plurality of reflecting means disposed to form a closed path through the gain medium for supporting the two pairs of waves, the waves in each of the two pairs of

waves traveling in opposite directions, the pair of waves in the first one of the two pairs of waves having a first sense of circular polarization and frequencies f_1 and f_2, and the pair of waves in the second one of the two pairs of waves having a second, opposite sense of circular polarization and frequencies f_3, f_4, at least one of said reflecting means being a cavity output window having a first region of a surface thereof partially transmitting of waves in the two pairs of waves incident thereon to produce a pair of cavity output beams, a first one of the pair of cavity output beams comprising a portion of one of the waves of the first one of the two pairs of waves traveling in the first direction and a portion of one of the waves in the second pair of the two pairs of waves traveling in the first direction and a second one of the pair of cavity output beams comprising a portion of one of the waves in the first one of the two pairs of waves traveling in the second direction and a portion of one of the waves in the second one of the two pairs of waves traveling in the second direction, the waves in each of the two cavity output beams having opposite senses of polarization;

(b) a beam splitter;

(c) means for directing a first one of the pair of cavity output beams along a first path and a second one of the pair of cavity output beams along a second path to a common region of the beam splitter, said directing means including a retro-reflector disposed in the second path to redirect the second one of the pair of cavity output beams, such



beam splitter transmitting a portion of a first one of the cavity output beams and reflecting a portion of the redirected, second one of the cavity output beams along a first common path to produce a first composite beam and for transmitting a portion of the redirected, second one of the cavity output beams and reflecting a portion of the first one of the cavity output beams to produce a second composite beam, such second composite beam being reflected by a second region of the surface of the cavity output window to direct such second composite beam along a second, different common path, both the first composite beam and the second composite beam having waves of frequencies f_1, f_2, f_3 and f_4;

(d) means disposed in the first and second common paths of the composite beams and displaced from the first and second paths of the cavity output beams for converting the waves in the first composite beam and the second composite beam to substantially linear polarization, the waves of opposite sense of polarization being converted to substantially orthogonal linear polarization; and

(e) detecting means responsive to the energy in the converted first and second composite beams for producing a pair of electrical signals, a first one of the pair of electrical signals representing the difference in the frequencies f_1, f_2 of the waves in the cavity in the first one of the two pairs of waves and the second one of the pair of electrical signals representing the difference in the frequencies f_3, f_4 of the waves in the cavity in the second one of the two pairs of waves.

4,449,825

OPTICAL MEASURING APPARATUS EMPLOYING A LASER

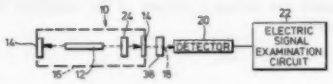
Albert D. May, Toronto, Canada, assignor to The University of Toronto Innovations Foundation, Toronto, Canada

Filed Jun. 11, 1981, Ser. No. 272,520

Claims priority, application Canada, Jun. 16, 1980, 354108

Int. Cl.³ G01B 9/02

U.S. Cl. 356—349 **11 Claims**



1. Optical measuring apparatus comprising:

laser, including a laser gain tube;

exciting means for exciting a laser beam to be produced by the gain tube, said laser beam having a laser beam axis;

reflecting means located opposite respective ends of the gain tube;

the reflecting means and the laser gain tube forming a laser cavity, the laser being tunable by the exciting means to provide at least two orthogonal polarization modes of the laser beam, said modes each having a frequency;

optical means locatable within the laser cavity between one end of the laser gain tube and one of the reflecting means, the optical means comprising at least two spaced quarter-wave plates located substantially perpendicular to the laser beam axis, at least one of the quarter-wave plates being rotatable relative to the other quarter-wave plate substantially about the laser beam axis, the polarization modes passing through the optical means and the laser cavity and forming a laser cavity output;

detector means for receiving the laser cavity output and providing a corresponding electrical signal;

signal examination means connected to the detector means for receiving and processing the electrical signal;

whereby, in use, the at least one rotatable quarter-wave plate is rotated relative to the other quarter-wave plate about the laser beam axis in response to a physical parameter being measured, the relative rotation between the quarter-wave plates causing the polarization modes and frequencies of the polarization modes to change, the different frequencies being detected and processed to provide a beat signal which is a direction function of the physical parameter being measured.

4,449,826

APPARATUS FOR PREPARING MORTAR OR THE LIKE

Paul Mathis, Merdingen, and Anton Wachter, Hindelang, both of Fed. Rep. of Germany, assignors to Mathis Systemtechnik GmbH, Merdingen and Wachter KG Baustoffwerk, Hindelang/Allgäu, both of, Fed. Rep. of Germany

Filed Oct. 30, 1981, Ser. No. 316,685

Claims priority, application Fed. Rep. of Germany, Oct. 31, 1980, 3041107

Int. Cl.³ B28C 1/16, 5/14

U.S. Cl. 366—13 **55 Claims**

1. Apparatus for making mortar and analogous building materials comprising:

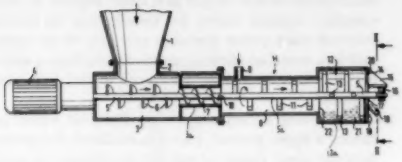
(a) a housing defining a mixing chamber which communicates with a source of air;

(b) admitting means for supplying solid and liquid constituents of a building material to a first section of said mixing chamber;

(c) mixing and advancing means for forming an air-containing mixture of the solid and liquid constituents and for advancing the mixture towards a second section of said mixing chamber; and

(d) impeding means for impeding discharge of the mixture

from said housing and causing accumulation of the mixture in said second section to thereby permit additional air to be mixed into the mixture, said housing having a discharge opening connecting said mixing chamber with the exterior of said housing, and said mixing and advancing means being arranged to discharge the mixture through



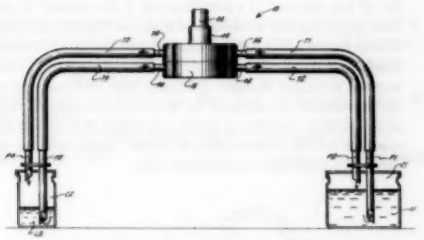
said discharge opening against the action of said impeding means at a rate such that an air space is substantially continuously maintained in said second section, said housing being devoid of driven means for assisting said mixing and advancing means in the discharge of the mixture through said discharge opening to thereby prevent the action of said impeding means from being nullified.

4,449,827

MIXING DEVICE

Kenneth G. Karkiewicz, Richmond, Va., assignor to Ethyl Molded Products Company, Richmond, Va.

Filed Oct. 29, 1982, Ser. No. 437,733
Int. Cl.³ B01F *15/02, 5/12*
U.S. Cl. 366—131 **20 Claims**



1. A mixing device for mixing together the liquid contents of a first and second container, whereby, after mixing, the resultant mixture resides in both containers, said mixing device comprising:

(a) a hollow pump chamber;

(b) a flexible pumping diaphram which traverses said pump chamber whereby said pumping chamber is divided into a separate upper chamber and a separate lower chamber, and whereby said flexible pumping diaphram is flexibly movable to a first position which, simultaneously, decreases the volume of said lower chamber and increases the volume of said upper chamber and to a second position which, simultaneously, increases the volume of said lower chamber and decreases the volume of said upper chamber;

(c) a first valving means for opening and closing ingress of fluid from said first container into said upper chamber and a second valving means for opening and closing egress of fluid from said upper chamber to said second container, said first and second valving means being opened and closed, respectively, when said flexible pumping diaphram is in said first position and being closed and opened, respectively, when said flexible pumping diaphram is in said second position;

(d) a third valving means for opening and closing ingress of fluids from said second container into said lower chamber and a fourth valving means for opening and closing egress of fluid from said lower chamber to said first container, said third and fourth valving means being opened and closed, respectively, when said flexible pumping diaphram is in said second position, and being closed and opened, respectively, when said flexible pumping diaphram is in said first position; and

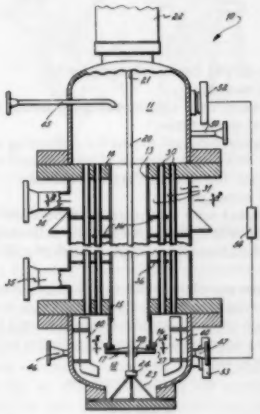
(e) moving means for moving said flexible pumping diaphram from one of its said positions to the other of its said positions.

4,449,828

MIXING APPARATUS

Maher L. Mansour, Columbus, Ohio, assignor to Ashland Oil, Inc., Ashland, Ky.

Continuation of Ser. No. 200,956, Oct. 27, 1980, abandoned.
This application Mar. 17, 1983, Ser. No. 476,363
Int. Cl.³ B01F *7/26*
U.S. Cl. 366—147 **7 Claims**



1. Chemical mixing apparatus for mixing liquids having a tendency to gel during mixing comprising,

a vessel, said vessel including an upper section, a middle section and a lower section, said upper section being connected to said middle section and the interior of said upper section being open to the interior of said middle section and

said middle section being attached to said lower section and the interior of said middle section being open to the interior of said lower section;

means to detach said upper section from said middle section;

means to detach said middle section from said lower section;

said upper section, said middle section and said lower section joining together to define a pressurizable mixing area;

a large, vertical draft tube open at both ends in the central portion of the middle section of the vessel,

a plurality of vertical heat exchanger tubes, open at both ends, surrounding said draft tube, said tubes positioned within the middle section of said vessel,

a centrifugal impeller at one end of said draft tube to circulate fluids between said draft tube and said heat exchanger tubes,

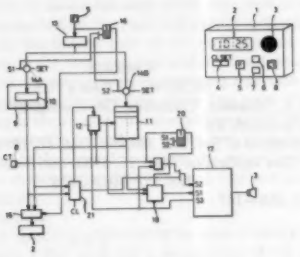
a means for circulating heat exchange fluid around said heat exchanger tubes, and

means to measure the pressure differential between said upper and said lower sections.

4,449,829
SPEECH SYNTHESIZER TIMEPIECE

Yutaka Ikemoto, Shiki-gun, and Akira Tanimoto, Kashihara, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jul. 30, 1981, Ser. No. 288,331
Claims priority, application Japan, Jul. 30, 1980, 55-109099[U]
Int. Cl.³ G04B *21/08*
U.S. Cl. 368—63 **2 Claims**

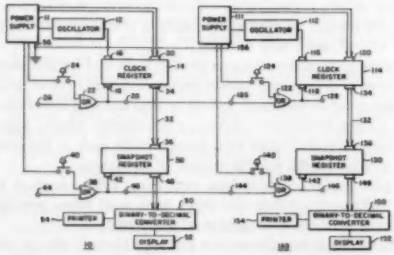


1. An audio output timepiece comprising:
timekeeping means;
means associated with said timekeeping means for setting a plurality of alarm times;
speech synthesizer output means for delivering audible indications of hours and minutes at each of said alarm times;
memory means for storing data representing a plurality of additional messages;
means associated with said memory means and said speech synthesizer output means for further delivering a selected one of said additional messages at each of said alarm times; and
selector means associated with said memory means and said speech synthesizer means for delivering a verbal indication of each of said additional messages and for selecting respective ones of said additional messages to be delivered at said alarm times.

4,449,830
METHOD AND APPARATUS FOR MEASURING ELAPSED TIME BETWEEN AN INITIATING EVENT AND A DEPENDENT EVENT

Lawrence W. Bulgier, West Suffield, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Jul. 31, 1981, Ser. No. 288,842
Int. Cl.³ G04F *8/00, 10/00*
U.S. Cl. 368—119 **8 Claims**



1. A timing system for determining the time interval between the occurrence of an initiating event and a dependent event, comprising:
a first timing means comprising, a first power supply having a signal ground; a first oscillator for generating periodic clock pulses of a known frequency; a first resettable clock register for counting clock pulses generated by said first oscillator, powered by said first power supply; means for resetting said first clock register; a first snapshot register; means for initiating the transfer of the number of counted clock pulses stored in said first clock register to said first snapshot register; means for transferring the number of counted clock pulses stored in said first clock register to said first snapshot register; means for displaying said number of counted clock pulses stored in said first snapshot register;
a second timing means comprising, a second power supply having a signal ground; a second oscillator for generating periodic clock pulses of said known frequency, powered by said second power supply, a second resettable clock register for counting clock pulses generated by said second oscillator; means for resetting said second clock register; a second snapshot register; means for intiating the transfer of the number of counted clock pulses stored in said second clock register to said second snapshot register; means for transferring the number of counted clock pulses stored in said second clock register to said second snapshot register; means for displaying said number of counted clock pulses stored in said second snapshot register;
means for interconnecting said signal ground of said first power supply and said signal ground of said second power supply;
means for interconnecting said means for resetting said first clock register and said means for resetting said second clock register; and
means for interconnecting said means for intiating the transfer of the number of counted clock pulses stored in said first clock register to said first snapshot register and said means for intiating the transfer of the number of counted clock pulses stored in said second clock register to said second snapshot register, whereby said first and second timing means are adapted to be interconnected for synchronization, capable of being separated for timing and adapted to be interconnected again subsequent to the timing to determine an absolute time.

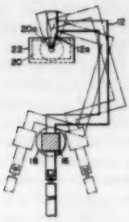
4,449,831
PENDULUM ARRANGEMENT FOR CLOCK MOVEMENT

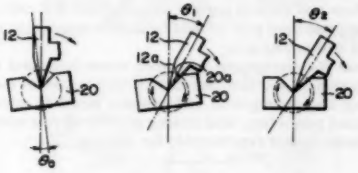
Masaru Itami, Nagano, and Kunio Tatusawa, Saitama, both of Japan, assignors to Rhythm Watch Co., Ltd., Tokyo, Japan

Filed Jul. 28, 1982, Ser. No. 402,585
Claims priority, application Japan, Jul. 31, 1981, 56-114215[U]; Jun. 3, 1982, 57-82534[U]
Int. Cl.³ G04F *5/00*; G04B *15/00*
U.S. Cl. 368—165 **4 Claims**

1. A pendulum arrangement for a clock movement in which said arrangement has a pendulum arm being mounted to swing freely at a pendulum arm supporting means which is installed on a clock movement housing, and said pendulum arm supporting means consists of a pendulum arm supporter which is pivotally held with free rotation on the clock movement housing so that the pendulum arm supporter can rotate and adjust

its supporting position in accordance with the swinging state of the pendulum arm and the inclination of the clock movement,





said pendulum arm supporter consisting of a V-shaped groove which receives a knife edge of the pendulum.

4,449,832

PROGRAM INPUT AND/OR TIME SETTING DEVICE

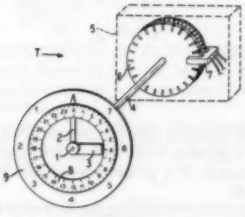
Gerd Kammerer, St. Georgen, Fed. Rep. of Germany, assignor to Dieter Graesslin Feinwerktechnik, Fed. Rep. of Germany

Filed Mar. 17, 1982, Ser. No. 359,036

Claims priority, application Fed. Rep. of Germany, Mar. 20, 1981, 3110947

Int. Cl.³ G04C *9/00*; G04B *29/00*; G08C *9/08*

U.S. Cl. 368—187 7 Claims



1. Apparatus for setting a digital-electronic time switch system comprising a command encoder means for emitting digital signals to a data memory means for controlling said time switch means, said command encoder means having transducer means for converting mechanical rotational movement in a forward or reverse direction into digital signals, and an adjustable dial assembly comprising a dial face formed with an annular time scale, at least one dial arm means selectively rotatable in forward and reverse directions about said dial face, and a train means mechanically connecting said dial arm means and said transducer means for varying the digital signals to said data memory, said transducer means comprising a rotatable slotted disk, a light barrier means for receiving an annular edge of said disk and generating light pulses by passage of said disk slots therethrough, and a pulse counter means connected to said light barrier means for converting said light pulses into digital signals and said light barrier means having a fork-shaped housing portion defining an opening through which said disk slots are passed, one arm of said housing portion containing a light transmitter and the other arm of said housing portion containing a pair of adjacent receivers for intercepting light from said transmitter passed through said disk slots, such that when one receiver is engaged by light from said transmitter the other receiver is shaded by said disk enabling said light barrier means to discern relative direction of movement of said disk.

4,449,833

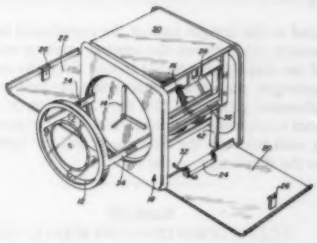
BREAK AWAY ALARM CLOCK

John R. Montgomery, IV, 2830 N. Burling (Unit D), Chicago, Ill. 60657, and Donald R. Richardson, 15340 Larkspur, Orland Park, Ill. 60462

Filed Feb. 27, 1981, Ser. No. 238,927

Int. Cl.³ G04B *13/00*

U.S. Cl. 368—262 11 Claims



1. A clock comprising

a clock face, a casing, and a clock mechanism positioned within said casing,

said casing including a plurality of separable walls,

said separable walls being mounted for outward movement from a closed, casing-defining configuration to an open configuration separated from said casing and exposing at least a portion of the interior of the casing,

latch means operatively coupled to said plurality of walls and having an engaged position for normally retaining said walls in said closed, casing-defining position and a released position permitting said outward movement from said closed configuration to said open configuration,

force applying means coupled to said said separable walls for causing said outward movement,

striker means mounted on said casing and being operatively connected to said latch means, said striker means being responsive to a manual force to cause said latch means to change from said engaged position to said released position, said force applying means automatically moving said plurality of separable walls outward to said open configuration upon said latch means changing to said released position.

4,449,834

AEROSTATIC AXIAL THRUST BEARING

Adrianus Franken, and Johannes L. M. Hagen, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed May 3, 1982, Ser. No. 374,441

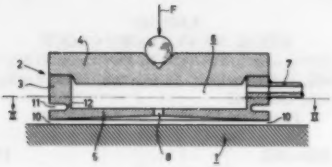
Claims priority, application Netherlands, May 11, 1981, 8102286

Int. Cl.³ F16C *32/06*

U.S. Cl. 384—99 1 Claim

1. An aerostatic axial thrust bearing comprising a movable part and a stationary part, one of said parts being constructed as a cup-shaped member having an upright wall, a closure member and a bottom comprising a diaphragm which faces the other bearing part to define therewith a bearing gap, said

upright wall and said diaphragm forming an integral unit, said diaphram having a central opening, the side of said diaphragm which faces the other bearing part being shaped so that the bearing gap between the two parts becomes narower from the central opening in the diaphragm towards the outer edge thereof, and the cup-shaped member having an inlet for the admission of a gaseous pressure medium to the space inside the cup-shaped member, characterized in that the diaphragm is



connected to the upright wall of the cup-shaped member only at a location (1) between the central opening and the outer edge of the diaphragm and (2) spaced from the outer edge of the diaphragm, the upright wall being provided with a deep circumferential groove so that only a portion of material remains that is substantially thinner than adjacent portions of said upright wall between the diaphragm and the upright wall to connect the diaphragm to the wall.

4,449,835

PRINTING DEVICE

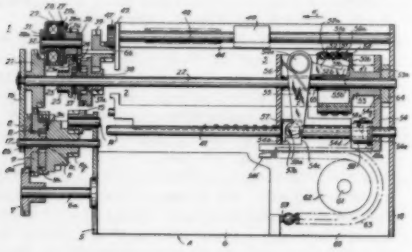
Kenichiro Arai, Shiojiri, Japan, assignor to Epson Corporation, Nagano and Kabushiki Kaisha Suwa Seikosha, Tokyo, both of, Japan

Filed May 6, 1982, Ser. No. 375,777

Claims priority, application Japan, May 7, 1981, 56-68822; Feb. 22, 1982, 57-26978

Int. Cl.³ B41J *1/34*

U.S. Cl. 400—161 **14 Claims**



1. A printing device for printing on a recording medium, comprising:

a type member having a plurality of characters and symbols thereon, said characters and symbols being individually subject to positioning for printing by impact with said recording medium;

a carriage supported by a frame, said type member being supported on said carriage;

means for selection of characters and symbols on said type member for printing;

means for driving selected characters to said recording medium for impact therewith and recording thereon;

a motor operating said printing device;

switch means for alternately switching the output of said motor between said selection means and said driving and impact means, in a first mode said selection means being powered from said motor to position said characters and symbols subject to selection, in a second mode said means for driving and impact being powered from said motor to move selected characters to said medium for printing, said switch means including at least first, second and third gears, said first gear being driven by a rotating output of said motor and turning said second gear, said second gear engaging said third gear, and a first cam surface having a locking portion thereon, said first cam surface being connected to said third gear for rotation therewith, said second gear travelling around the toothed periphery of said third gear when said first cam surface is fixed in position, motor power being applied in said first mode to said selection means by said second gear travel, said third gear and said first cam surface rotating by action of said second gear when said first cam surface is free to rotate, motor power being applied in said second mode to said driving and impact means by rotation of said third gear;

pawl means, said pawl means when engaged with said locking portion holding said first cam surface and third gear in said fixed position, said pawl means when disengaged from said locking portion releasing said first cam surface and said third gear for said rotation in response to rotation of said second gear;

means for disengaging said pawl means from said locking portion in said first cam surface, said means for disengaging cooperating with said selection means to release said pawl means from said locking portion when a selection is made on said type member for printing.

4,449,836

PRINTING HEAD FOR WIRE DOT PRINTER

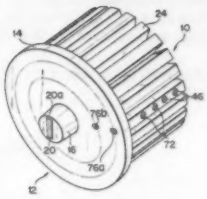
Noboru Yamada, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Aug. 4, 1982, Ser. No. 405,084

Claims priority, application Japan, Aug. 24, 1981, 56-132505

Int. Cl.³ B41J *3/12*

U.S. Cl. 400—124 **5 Claims**



1. A printing head for wire dot printer comprising:

a plurality of printing wires having front and back end portions arranged in a predetermined distribution, respectively; and

wire driving means for driving the back ends of said printing wires to move said printing wires both in a dot printing direction and in a returning direction, each of said wire driving means including an armature moved in a first direction so as to drive the back end of said printing wire, a magnetic frame comprising a plurality of magnetic members arranged in a reference plane including said first direction and having at least one permanent magnet and at least one soft magnetic member, said plural magnetic members being connected in series to form a magnetic circuit provided with an air gap, at least one connecting portion of said plural magnetic members included in said magnetic frame being defined by two of said magnetic members which are slidable relative to one another in the first direction, at connecting sliding surfaces so that the length of the air gap may be adjusted by the sliding movement, said sliding surfaces defining sliding planes including both a second direction perpendicular to the reference plane and the first direction, said connecting portion having screws arranged substantially perpendicular to said

sliding surfaces and pressing said two magnetic members one against the other and substantially perpendicular to said both of said sliding surfaces, an exciting coil wound around said magnetic frame and generating a magnetomotive force, when excited, to substantially off-set the magnetomotive force of said permanent magnet, and an armature support means attached to said magnetic frame to resiliently support said armature movable in the air gap in the first direction, said armature support means being slidable in both the first and second directions relative to said magnetic frame, to thereby adjust the free position of said armature in the air gap.

4,449,837

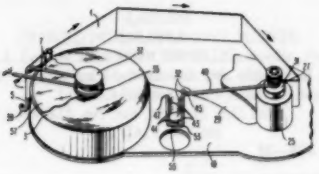
RIBBON CARTRIDGE WITH BACK CHECK

James A. Craft, 1734 Cameron Ct., Lexington, Ky. 40505

Filed Sep. 25, 1981, Ser. No. 305,763

Int. Cl.³ B41J *33/14*

U.S. Cl. 400—208 **5 Claims**



1. A ribbon cartridge having a supply spool mounted for rotation in the cartridge and a take-up spool hub mounted in said cartridge to receive ribbon which extends from said supply spool, out of said cartridge, and then back into said cartridge, said cartridge comprising a flexible member mounted inside said cartridge with a part in contact with said hub, said part being positioned to engage said hub when said hub turns counter to the take-up direction to stop movement of said hub and to slide on said hub when said hub turns in the take-up direction to permit movement of said hub.

4,449,838

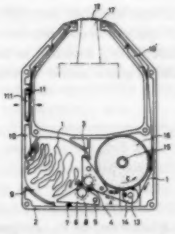
INK RIBBON CASSETTE FOR PRINTER

Yasushi Okamura; Harukazu Manabe, and Norihide Sato, all of Fukuoka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Jul. 28, 1982, Ser. No. 402,806

Int. Cl.³ B41J *32/02, 35/08*

U.S. Cl. 400—234 **8 Claims**



1. An ink ribbon cassette including:

an ink ribbon,

an ink-impregnated body,

an ink transfer roller turned by contact friction with the running of said ink ribbon, thereby making contact of said ink transfer roller with said ink ribbon and said ink-impregnated body to transfer ink from said ink-impregnated body via said ink transfer toller to said ink ribbon,

the improvement comprising:

at least one pressing force switching device movable between a pressing state and a non-pressing state for changing the pressing force applied to said ink ribbon said switching device being located in a narrow ink ribbon path wherein said ink ribbon is pressed by said pressing force switching device when said switching device is in a pressing state,

said cassette further comprises a pressing force device provided in sequence with said pressing force switching device, said cassette having a wall, said wall having a hole for receiving a tool insertable therethrough, said hole being adjacent said switching device for exposing said pressing force switching device to be moved by said tool for moving said pressing force switching device between said pressing and said non-pressing states.

4,449,839

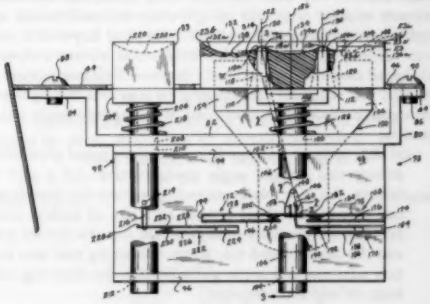
KEYBOARD WITH ELONGATE KEYS

Keith T. Bleuer, 1663 Wilshire Dr., NE., Rochester, Minn. 55901

Filed Sep. 22, 1982, Ser. No. 421,586

Int. Cl.³ B41J *5/28, 5/10, 5/12*

U.S. Cl. 400—485 **87 Claims**



1. Finger operated controlling mechanism including an elongated key having a finger thrust surface on which finger pressure can be applied for moving the key, means for mounting said key so that it can be moved on a thrust axis generally normal to said finger thrust surface and including transverse axis forming means for swingingly mounting the key so that it can be swung longitudinally of the key to have different rotative positions, three control devices, and an actuating member carried by said key so disposed that it can selectively actuate each of said control devices due to the movement of said key and actuating member on an operative stroke on said thrust axis with the particular one of said rotative positions determining which of said control devices is actuated on the operative stroke of the key, said finger operated controlling mechanism including means providing three slots and a part carried by said actuating member adapted to respectively enter the three slots for three different rotative positions of said key, said control devices being respectively in alignment with said slots to be actuated by said part when it moves through the three slots.

4,449,840

BINDER ASSEMBLY OF THE RING TYPE

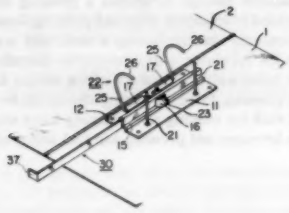
Kiyoshi Ohminato, Tokyo, Japan, assignor to King Jim Co., Ltd., Japan

Continuation of Ser. No. 185,758, Sep. 10, 1980, abandoned. This application Jun. 30, 1983, Ser. No. 509,593

Claims priority, application Japan, Dec. 27, 1979, 54-182451[U]

Int. Cl.³ B42F *3/04*

U.S. Cl. 402—34 **2 Claims**



1. A binder assembly of the ring type comprising a slide support member, an operable slide member, fixed holder rods and a turnable holder rod having a pair of spaced apart free ends, with said free ends being arranged in a face-to-face relation to the free ends of the fixed holder rods; said slide support member having a longitudinal upright angle guide portion centrally disposed therein and a longitudinal step section on one side thereof; said slide member comprising a keep formed by a lateral base plate, and an upright plate having a cam opening, the cam opening comprising an upper horizontal step section, a central inclined ramp section, and a lower horizontal keep section; said slide member being fitted into said slide support member with said upright plate disposed in said upright angle guide portion and said base plate disposed in said step section; and said turnable holder rod having a central U-shaped essentially horizontally disposed follower portion in engagement with said cam opening by way of a through-hole provided in the central lower end of the upright angle guide portion;

said slide support member being a unitary metal plate comprising said upright angle guide portion and a pair of bottom flat side plates extending outwardly therefrom, one of said side plates containing a pair of hollow pivot portions for pivotally mounting said turnable holder rod, and the other of said side plates containing said step section adjacent said angle guide portion for receiving said keep on said slide member.

4,449,841

FASTENING MEANS FOR AXIALLY SECURING MACHINE ELEMENTS AND METHOD THEREFOR

Manfred Brandenstein, Eussenheim, and Rüdiger Hans, Niederwerrn, both of Fed. Rep. of Germany, assignors to SKF Kugellagerfabriken GmbH, Schweinfurt, Fed. Rep. of Germany

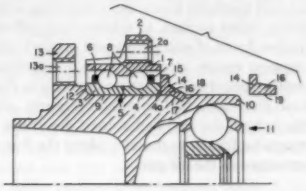
Filed Aug. 10, 1982, Ser. No. 406,908

Claims priority, application Fed. Rep. of Germany, Aug. 17, 1981, 3132443

Int. Cl.³ F16D *1/00*

U.S. Cl. 403—24 **6 Claims**

1. Means for securing a machine element such as a bearing assembly on a shaft member or the like having an annular groove (17) comprising an angular ring (14) having a radially outwardly directed leg portion (15) which abuts against an axial end face of the inner ring component to be secured, and an axial leg portion (16) which is pressed into said annular groove (17) at least at a plurality of circumferentially spaced locations about its periphery and a second ring member mounted on the shaft member and having a portion which



overlies and engages the axial leg portion of said angular ring (14).

4,449,842

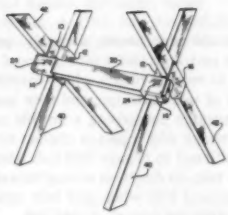
SLEEVE BRACKET

William Reichman, Jr., Greentown, Pa., assignor to Custom Wrought Products, Co., Greentown, Pa.

Filed Oct. 21, 1981, Ser. No. 313,604

Int. Cl.³ F16D *1/00*

U.S. Cl. 403—25 **11 Claims**



5. A structure comprising at least a pair of sleeve brackets in spaced relationship,

each sleeve bracket comprising at least three sleeves, each sleeve being in angularly offset relationship, to each other sleeve, each sleeve defining a hollow interior channel,

each sleeve being positioned in perpendicular relationship to the other two sleeves; and a plurality of frame members respectively inserted into the interior channels of the sleeves,

at least one said frame member extending horizontally between a pair of spaced sleeve brackets and the other of said frame member being oriented in angular relationship to both a horizontal plane and a vertical plane.

4,449,843

OCTA HUB

Wendel R. Wendel, Plainview, N.Y., assignor to Space Structures International Corp., Plainview, N.Y.

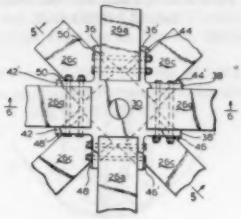
Filed Nov. 30, 1981, Ser. No. 325,802

Int. Cl.³ F16B *7/00*

U.S. Cl. 403—173 **8 Claims**

1. A connection for structural members including a plurality of hub components each of which has projecting ears constructed and arranged to receive the end of a structural member, said hub components being rotated to define angles be-

tween the respective ears of adjacent hub components, said hub components being precompressed together by bolt means



to form a structural unit capable of transferring axial and shear loads from said structural members attached to said ears.

4,449,844

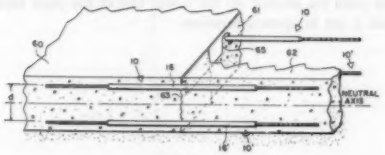
DOWEL FOR PAVEMENT JOINTS

Torbjorn J. Larsen, 3719 NW. 29th St., Gainsville, Fla. 32605

Filed Sep. 24, 1982, Ser. No. 422,672

Int. Cl.³ E01C *11/14, 11/02*

U.S. Cl. 404—60 **2 Claims**



1. A device for simultaneously controlling the width of a joint between concrete pavement slab sections, transferring vertical shear stresses across said joint, and transferring bending moments across said joint, comprising:

a pair of elastic bars, each of said bars having two end portions and a central portion and having a length short relative to the length of the slab sections, said pair of bars disposed symmetrically and longitudinally across said joint wherein one bar of said pair is disposed with its central portion near the top surface of the slab sections, and the other one of said pair is disposed with its central portion near the bottom surface of the slab sections, and arranged to transfer vertical loads and bending moments caused by a traffic load of a desired maximum value applied to one slab section across said joint to the adjacent slab section, said pair of bars selected to withstand such vertical loads and bending moments without deformation, each of said pair of elastic bars formed to dispose said end portions of said bars essentially along the neutral axis of the concrete slab sections; and

means for partially transferring longitudinal stress comprising bonding means associated with said end portions of said bars for bonding said end portions to the concrete slab sections along the neutral axis, and bonding prevention means associated with said central portion of said bars for allowing movement of said central portion with respect to the concrete slab sections, said stress transferring means partially transferring longitudinal stress in the concrete slab sections due to contraction and expansion of said pair of elastic bars, said elastic bars also selected to operate within their elastic limit over a desired stress range in such concrete slab sections to limit the joint gap width to a selected value.

4,449,845

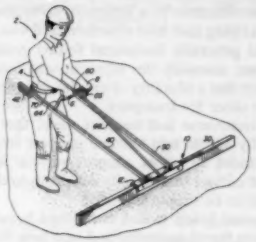
SCREED BOARD APPARATUS

Ernest V. Carrillo, 597 W. Gary Dr., Chandler, Ariz. 85224

Filed Oct. 13, 1981, Ser. No. 310,504

Int. Cl.³ E01C *19/22;* **E04G** *21/10*

U.S. Cl. 404—118 **7 Claims**



1. Walking screed apparatus, comprising, in combination:

a screed;

bracket means securable to the screed;

handle means secured to the bracket means, including

a first handle,

a first leg secured to the first handle and extending upwardly substantially perpendicularly to the first handle,

a second handle spaced apart from the first handle,

a second leg secured to the second handle and extending upwardly substantially perpendicularly to the second handle, and

a bar extending between the first and second legs for holding by a user to maneuver the screed;

a brace secured to and extending between the bar and the bracket means; and

flexible harness means secured to the handle means and adapted to be secured to the torso of a user for securing the screed apparatus to the user, and the bar is disposed between the harness means and the bracket means.

4,449,846

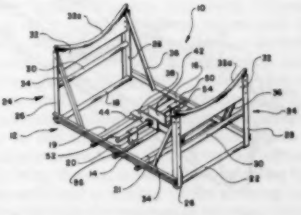
TRANSVERSE SADDLE TYPE BOAT CRADLE

James W. Price, Rte. 1 Box 87, Grifton, N.C. 28530

Filed Apr. 22, 1982, Ser. No. 370,838

Int. Cl.³ B63C *5/05*

U.S. Cl. 405—7 **9 Claims**



1. A fore-and-aft transverse saddle type boat cradle for supporting a boat, wherein said boat cradle is capable of assuming a collapsed, folded down position in order that respective boat cradle can be stacked one on top of another for economical and practical transport, comprising:

A. a base frame structure including a generally rectangular frame having two laterally spaced apart longitudinally extending frame members and a plurality of transverse frame members operatively interconnected between said longitudinal frame members;

B. fore-and-aft vertical support frame assemblies secured to

said base frame structure and in an operative boat supporting mode extend upwardly for transversely engaging and supporting a boat at fore-and-aft areas, each of said fore-and-aft vertical support frame assemblies including:

1. means movably mounting said vertical support frame assembly to said base frame structure for movement from a vertical support position inwardly toward said base structure to a generally horizontal folded position overlying said base structure, and visa versa, wherein in said generally horizontal folded position said support frame assembly lies adjacent said base frame structure such that a plurality of cradles may be stacked one over the other for transport;
2. a transverse hull support panel that extends substantially across said vertical support frame assembly and includes an upper support surface selectively shaped and curved to generally comform to the shape of a boat hull to be supported;

C. diagonal brace means connected between said vertical support frame assembly and said base frame structure for diagonally bracing said vertical support frame assemblies when the latter is positioned upright in a supporting mode of operation, said diagonal brace means including a pair of diagonal braces detachably connected between each vertical support frame assembly and said base frame structure; and

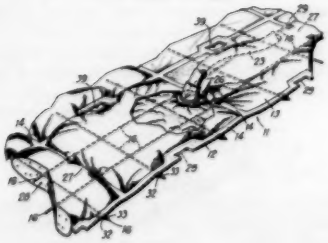
D. keel restraining means mounted on at least one of said transverse frame members of said base frame structure for generally preventing the keel from moving laterally, thereby assuring that the boat being supported is supported in a generally upright posture said keel restraining means including a pair of laterally spaced restraining panels that normally and generally extend in vertical planes and which define therebetween a space for receiving the keel of a boat being supported whereby the presence of said panels about opposite sides of the keel tends to restrict the lateral movement of the keel.

4,449,847

REVETMENT PANEL

John M. Scales, Norcross, and Bernard F. Wolcott, Roswell, both of Ga., assignors to Nicolon Corporation, Norcross, Ga.

Filed Sep. 27, 1982, Ser. No. 424,563
Int. Cl.³ E02B 3/12
U.S. Cl. 405—19 20 Claims



1. A web comprising:

(a) an upper and a lower fabric layer;

(b) a plurality of interconnected compartments, the walls of which are formed where the fabric layers are woven separately;

(c) selvage separating the compartments, formed by interweaving the fabric layers;

(d) a plurality of cable slots formed in the selvage, where the fabric layers are woven separately, each of the cable slots communicating with one or more of the compartments; and

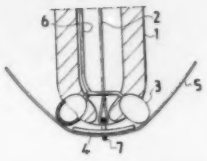
(e) a plurality of cables passing through the cable slots and interconnecting the compartments.

4,449,848

MEANS FOR PROVIDING A VERTICAL DRAIN IN SOIL

Mauno O. Jubola, Lounaisväylä 2, 00200 Helsinki 20, Finland

Filed Feb. 9, 1983, Ser. No. 465,045
Int. Cl.³ E02D 3/10
U.S. Cl. 405—50 2 Claims



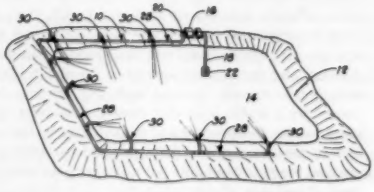
1. Improvement in a means for providing a vertical drain in soil, comprising a push tube to be pushed into the soil and which carries within itself a prefabricated drain provided with a plate-like anchor on the lower end, said anchor resting against the lower end of the push tube and keeping the prefabricated drain stationary while the push tube is pulled upwards, wherein the improvement comprises that the lower end of the push tube is provided with at least one pouch-like pressure member located between said push tube and the anchor and which can be inflated by the aid of a pressurezed fluid so that it will push the anchor off the lower end of the push tube and spread it out in opened position.

4,449,849

METHOD OF REMOVING WATER FROM EARTHEN PITS

Spencer C. Horn, Ft. Cobb, and Alan A. Mogg, Lookeba, both of Okla., assignors to S & A Oil Field Services, Inc., Ft. Cobb, Okla.

Filed Jul. 19, 1982, Ser. No. 399,441
Int. Cl.³ E02B 1/00
U.S. Cl. 405—52 5 Claims



1. A method of removing an earthen pit containing aqueous well drilling fluid from the site thereof comprising the steps of:

allowing solids suspended in said drilling fluid to settle to the bottom portion of said pit;

placing a plurality of spray nozzles around the periphery of said pit, said nozzles being directed towards the center of said pit;

pumping water from the top portion of said pit through said spray nozzles whereby said water is sprayed towards the center of said pit until a major portion of said water is removed therefrom by evaporation; and

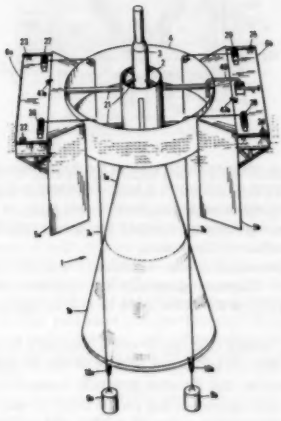
covering the remaining minor portion of water and settled solids and filling in said pit with earth to thereby remove said pit.

4,449,850

ANTIPOLLUTION DEVICE FOR RECOVERING FLUIDS LIGHTER THAN WATER ESCAPING FROM AN UNDERWATER SOURCE

Maurice Cessou, and Lucien Perez, both of Communay, France, assignors to Institut Francais du Petrole, Rueil-Malmaison, France

Filed Nov. 14, 1980, Ser. No. 207,044
Claims priority, application France, Nov. 16, 1979, 79 28354
Int. Cl.³ E02B 15/04
U.S. Cl. 405—60 10 Claims



1. An antipollution device for recovering fluids lighter than water, escaping from an underwater source (8), comprising:

(a) a collector element (1) adapted for capping said source (8) for trapping the fluids escaping therefrom, said collecting element (1) comprising a lower part (1*b*) and an upper part (1*a*) with at least said lower part (1*b*) being flexible and foldable, and the wall of said lower part (1*b*) being permeable;

(b) collecting means (2, 2*a*) connected to said collector element (1) and positioned above said collector element (1) for collecting escaping fluids trapped by said collector element (1), said collecting means comprising a recovery chamber (2, 2*a*) located above said collector element (1), said recovery chamber (2, 2*a*) being connected to said collector element (1), and operatively associated with gas-liquid separation means (3,16) for separating said collected escaping fluids into a liquid phase and a gas phase;

(c) an annular tank (4) surrounding said recovery chamber (2, 2*a*) for recovering the separated liquid phase, and said annular tank (4) being open at its lower part and provided with adjustable bouyancy means (5, 5*a*) comprising two vertically extending ballast chambers (5*a*, 5*b*) defining two annular sectors diametrically located at the periphery of said annular tank (4), and secured thereto; and

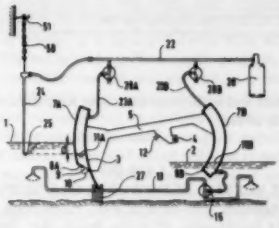
(d) handling means (7*a*, 7*b*) operatively connected to said lower part (1*b*) for unfolding said lower part (1*b*) from a folded position at the water surface during positioning of said collector element (1) over a source of escaping fluid.

4,449,851

ENERGY-EFFICIENT AUTOMATIC SLUICE GATE FOR SUSTAINING A FLUID LEVEL

Gilles Combes, Grenoble, and Germain Delage, Saint-Ismier, both of France, assignors to Alsthom-Atlantique, Paris, France

Filed Dec. 13, 1982, Ser. No. 449,292
Claims priority, application France, Jan. 12, 1982, 82 00344
Int. Cl.³ E02B 7/42
U.S. Cl. 405—93 7 Claims



1. An energy-efficient automatic sluice gate for sustaining a fluid level, wherein said gate controls the flow of water from an upstream pool to a downstream pool and comprising:

a closing baffle carried by a framework movable about a horizontal rotating shaft located downstream from the baffle such that rotation of said framework about said shaft controls a section of water flowing from upstream to downstream, said baffle constituting one segment of a revolving cylinder with said rotating shaft as its axis;

and at least one box member carried by said framework, which dips into the pool, the level of which must be maintained so that the angular position of said framework is determined by the water level therein, said at least one box member having an opening at the bottom for the passage of water and an opening at the top for the passage of air to enable the amount of water in the box member to be varied;

said at least one box member comprising an upstream box member and a downstream box member, both carried by the framework, located opposite one another across from said shaft such as to be held partially immersed respectively in the upstream and downstream pools, the pools being separated by the above-mentioned baffle with both box members having openings in their tops and bottoms;

and pressure regulating means operatively communicating with said openings via switching valves such that they may be caused to operate alternately in an upstream regulation mode and a downstream regulation mode, said regulation means controlling the water level in a regulating box member, constituting said upstream box member in the upstream regulation mode and said downstream box member in the downstream regulation mode, so as to automatically maintain the water level in a regulated pool or basin, being the one in which the regulating box member dips, with said switching valves allowing water and air to flow through the openings in the other, non-regulating box member to balance the water levels obtaining in said non-regulating box member and in the unregulated pool.

4,449,852

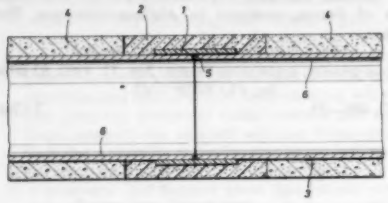
BUCKLE ARRESTOR

Larry C. Muszynski, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Jul. 30, 1982, Ser. No. 403,377
Int. Cl.³ F16L 1/00, 9/22
U.S. Cl. 405—168 10 Claims

1. A pipeline buckle arrestor or preventor secured to the

outside circumference of a minor portion of a steel pipeline comprising a fiber-reinforced resin cover immediately adjacent



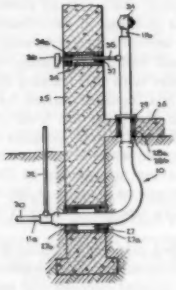
to the pipeline and a polymer-concrete formulation encapsulating the resin cover.

4,449,853

FLEXIBLE SLEEVE ELBOW FOR GAS SERVICE LINES

Robert J. Mennella, 252-48 60th Ave., Little Neck, N.Y. 11362, and David Davidowitz, 17 Colts Brook Rd., Marlboro, N.J. 07746

Filed Apr. 11, 1983, Ser. No. 483,667
Int. Cl.³ F16L *5/00*
U.S. Cl. 405—184 **3 Claims**



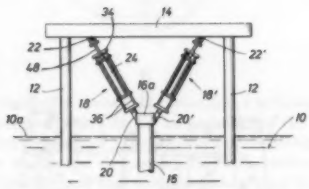
1. The method of installing a gas service line leading from an underground exterior location past the building line of a building or the like and upwardly through a ground slab to a location within the building, comprising the steps of providing a small opening through said ground slab in the vicinity of said exterior location of said gas service line, providing a narrow passage in the earthen fill between said ground slab opening and said gas service line, snaking a flexible sleeve elbow unit downwardly through said ground slab opening and said passage and thence horizontally past said building line, said flexible sleeve elbow unit comprising an inner corrugated gas service pipe having respective projecting rigid pipe upper end and lower end portions, and an outer casing pipe comprising a corrugated length portion surrounding said inner corrugated gas carrier pipe to provide an annular spacing therebetween, and respective rigid pipe upper and lower end portions attached in gas-tight sealing relationship to the respective of said upper and lower rigid pipe end portions of said gas carrier pipe, attaching said projecting lower end portion of said gas carrier pipe to said gas service line at said underground exterior location of the building with at least said rigid lower end portion of said casing pipe projecting exteriorly beyond said building line, said upper end portion of said gas carrier pipe and at least a portion of said rigid upper end portion of said rigid upper end portion of said casing pipe then projecting above said ground slab at said location within said building, securing said elbow unit in place by filling said passage with filling material within the area thereof which surrounds said elbow unit and closing said slab opening around said elbow unit, and providing a gas vent extending from said annular space to the atmosphere exterior of said building.

4,449,854

MOTION COMPENSATOR SYSTEM

Douglas W. J. Nayler, Kingwood, Tex., assignor to NL Industries, Inc., New York, N.Y.

Filed Feb. 12, 1981, Ser. No. 233,832
Int. Cl.³ E02D *21/00*; E21B *7/128, 19/09*; F16F *9/18*
U.S. Cl. 405—195 **9 Claims**



1. A motion compensation system for disposition between an offshore support structure in a body of water and a riser-type pipe structure mounted to the floor of said body of water, said structures having respective upper portions normally disposed above the surface of the water,

said compensation system including a pair of motion compensators disposed generally on opposite sides of said riser-type pipe structure, each of said compensators comprising:

a cylinder having one end directed generally toward a connection area on said upper portion of one of said structures and the other end directed generally toward a connection area on said upper portion on the other of said structures;

a piston reciprocably mounted within said cylinder;

a piston rod adjoining said piston and protruding outwardly through said one end of said cylinder;

first connection means connecting said cylinder to said connection area of said one structure;

second connection means connecting the protruding part of said piston rod to said connection area of said other structure independently of said first connection means and of said cylinder;

and a compressible fluid disposed between said piston and said other end of said cylinder to resist movement of said piston toward said other end of said cylinder and thereby resist relative movement of said connection areas of said structures away from each other;

and said pair of motion compensators being angularly oriented with respect to vertical and oppositely to each other to compensate for both lateral and vertical relative movement of said structures.

4,449,855

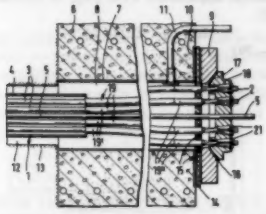
ANCHOR HEAD FOR A CORROSION-PROTECTED INJECTED ANCHOR

Otmar Langwadt, Munich, Fed. Rep. of Germany, assignor to Dyckerhoff & Widmann Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Jun. 17, 1982, Ser. No. 389,562
Claims priority, application Fed. Rep. of Germany, Jun. 26, 1981, 3125166
Int. Cl.³ E21D *20/02*
U.S. Cl. 405—260 **3 Claims**

1. An anchor head for a corrosion-protected prestressable injected anchor for use as a permanent ground anchor or rock anchor comprising a tension member arranged to extend through and out of a borehole, said tension member comprising

a plurality of individual steel members arranged in a bundle, an abutment member arranged to be located spaced outwardly from the borehole, an anchor plate supported on said abutment member on the opposite side thereof from the borehole, said anchor plate having bores therethrough each for an individual one of said steel members, said anchor plate having a first surface facing in the direction of said bundle of steel members and an oppositely directed second surface, said bundle of steel members being in closely spaced relation within the borehole and fanned outwardly relative to one another between the borehole and said abutment member, a corrosion sheathing on each of said steel members, a closure plate located on the first



surface side of said anchor plate and spaced from said anchor plate by said abutment member, said closure plate having a number of openings therethrough corresponding to the number of said steel members, said steel members extend through said openings in said closure plate, a sleeve tube laterally encloses each of said steel members and said corrosion sheathing on said steel members in the fanned-out region thereof and in the region where the steel members extend through said closure plate so that said steel members extend through said closure plate in a sealed manner, and means cooperating with said another plate for fixing the ends of said steel members in said anchor plate.

4,449,856

GROUT INJECTION METHOD AND APPARATUS

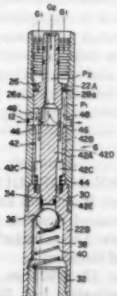
Takehiko Tokoro, Iruma; Shoichi Kashima, Sagamihara, and Mineo Murata, Tokyo, all of Japan, assignors to Nihon Soil Engineering Co., Ltd.; Nihon Sogo-Bosui Co., Ltd. and Yamaguchi Kikai Kogyo Co., Ltd., all of Tokyo, Japan

Filed Feb. 3, 1982, Ser. No. 345,445

Claims priority, application Japan, Dec. 16, 1981, 56-204047

Int. Cl.³ E02D *3/12*

U.S. Cl. 405—269 **15 Claims**



1. A method of injecting grout into soil, the grout being prepared by mixing a first liquid and a second liquid to form a grout, the method being performed by using an injection pipe comprising an outer pipe member and an inner pipe member coaxially disposed in said outer pipe member, said outer pipe member having a nozzle at the tip end thereof for jetting a boring fluid therefrom, an axially extending guide passageway in said outer pipe member spaced upwardly from said tip end thereof, injection orifice means in the peripheral wall of said outer pipe member spaced upwardly from said guide passageway, said inner pipe member extending from the upper end of said injection pipe partway along the length thereof to a location close to said injection orifice means, said inner pipe member having exit port means at or close to the lower end thereof, an axially slidable spool valve fitted in said outer pipe member between the lower end of said inner pipe member and said guide passageway, resilient means continuously urging said spool valve upwardly in a direction away from the tip end of said outer pipe member to a first upper position, said spool valve being movable toward said tip end to a second lower position in which said spool valve closes said guide passageway, said spool valve having an upright central spool portion axially slidably receivable in said inner pipe member to close said exit port means when said spool valve is in said first position and to open said exit port means when said spool valve is in said second position, said central spool valve portion having an upper surface adapted to be acted on by the pressure of the liquid fed into said inner pipe member so that said spool valve can be moved from said first position to said second position against the urging of said resilient means when pressurized liquid is fed into said inner pipe member, said spool valve having a peripheral shutter portion integral with said spool portion and axially slidably disposed in the space between said inner and outer pipe members for closing said injection orifice means when said spool valve is in said first position and for opening said injection orifice means when said spool valve is in said second position, said inner and outer pipe members defining a first passage therebetween, said inner pipe member defining a second passage therewithin, said inner and outer pipe members and said spool valve defining a mixing chamber in said first passage when said spool valve is in said second position, said mixing chamber being located between and communicating with said exit port means and said injection orifice means, said spool valve having axially extending through holes located between said spool portion and said shutter portion and providing communication between said first passage and said guide passageway, said method comprising the steps of feeding only a boring fluid into said first passage while said spool valve is maintained in said first position so that the boring fluid flows through said first passage, said through holes, said guide passageway and thence out the top of said injection pipe whereby to bore a hole in the ground; then feeding said first and second liquids through said first and second passages, respectively, the pressure of said second liquid being effective to shift said spool valve to said second position whereby to block said guide passageway, open said exit port means and said injection orifice means and form said mixing chamber so that the first and second liquids meet, contact and mix with each other in the mixing chamber and the mixture thereof is injected through the injection orifice means into the ground.

4,449,857

RETAINED EARTH SYSTEM WITH THREADED CONNECTION BETWEEN A RETAINING WALL AND SOIL REINFORCEMENT PANELS

Edgar A. Davis, San Jose, Calif., assignor to VSL Corporation, Los Gatos, Calif.

Filed Oct. 26, 1981, Ser. No. 314,699

Int. Cl.³ E02D *29/02*

U.S. Cl. 405—286 **5 Claims**

1. A soil retaining system comprising

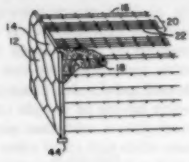
(a) an upright soil retaining wall comprising interlinked modular facing panels,

(b) a plurality of soil reinforcement panels, each comprising a plurality of spaced generally parallel wires and spaced crossbars rigidly mounted at crossover points of said

parallel wires in generally perpendicular relationship, one end of said parallel wires terminating in enlarged bulbous portions,

(c) a plurality of cylindrical internally threaded female members anchored in the back sides of said facing panels, said female members forming at least one tandem, spaced, generally horizontal row,

(d) a plurality of cylindrical externally threaded interconnecting male members mating with said female members and disposed therein, each of said male members having a



forward end wall directed toward said retaining wall, each of said male members defining an axially aligned bore of a width larger than the diameter of one of said wires, but smaller than the bulbous portions, whereby said wire is rotatable with respect to said bore when seated therein, said bores being spaced to register with the parallel wires of said mesh panels, and

(e) the wires of one of said mesh panels being disposed in said bores with the bulbous portions seated to bear against said forward end walls of said male members to interconnect corresponding facing panels and mesh panels.

4,449,858

METHODS AND/OR APPARATUS FOR INCREASING THE OVERTURNING RESISTANCE OF RETAINING WALLS

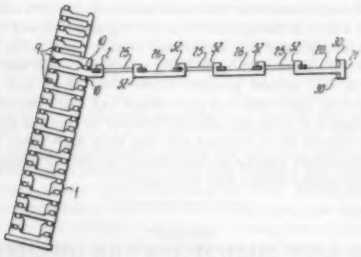
John R. Hynds, Auckland, New Zealand, assignor to J. R. Hynds Limited, Auckland, New Zealand

Filed Jun. 21, 1982, Ser. No. 390,371

Claims priority, application New Zealand, Jun. 24, 1981, 197519

Int. Cl.³ E02D *17/00*

U.S. Cl. 405—286 **6 Claims**



1. Restraining means for increasing the resistance to overturning of a crib retaining wall comprising, a restraining header adapted to be incorporated in said crib wall as a part thereof intermediate the height of said wall, a hook member integral with said restraining header and extending outwardly therefrom in the direction of restraining, a plurality of interlinking block members each comprising hook shaped end portions interconnected by a longitudinal intermediate portion, said hook ends of said block members being interlinked to form an elongated chain of said interlinking block members and the free hook at one end of said chain being interlinked with said hook member on said restraining header, a deadman adjacent the other end of said chain of interlinking block members, and means to connect the free hook at said other end to said deadman.

4,449,859

MINERAL MINING INSTALLATION

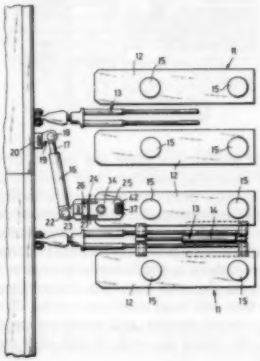
Günter Terhorst, Dülmen; Karl-Heinz Piester, Lunen; Harry Rosenberg, Ludinghausen, and Friedrich Eggenstein, Bergkamen-Oberaden, all of Fed. Rep. of Germany, assignors to Gewerkschaft Eisenhutte Westfalia, Lunen, Fed. Rep. of Germany

Filed Jun. 4, 1982, Ser. No. 384,877

Claims priority, application Fed. Rep. of Germany, Jun. 10, 1981, 3122952

Int. Cl.³ E21D *15/00*

U.S. Cl. 405—291 **10 Claims**



1. In a mineral mining installation including a longwall structure and a roof support unit, the roof support unit being provided with a substantially horizontal hydraulic bracing ram disposed at an acute angle to the longwall structure and acting on said structure to brace said structure longitudinally, the bracing ram being attached to a floor sill of the roof support unit by a bracket, the bracket having connection means for connecting the bracket to the floor sill and a pivot joint member for connection to the bracing ram, the improvement comprising forming the bracket by first and second bracket parts, the second bracket part being rigidly connected to the first bracket part, the first bracket part comprising said connection means and being of a plate-like construction carrying a claw at one end thereof which is engageable with a free end of the floor sill, the first bracket part having an apertured boss adjacent to the claw, there being a coupling pin which is received in the apertured boss and which is engageable in an aperture in said floor sill, and the second bracket part forming an extension of the first bracket part and carrying the pivot joint member.

4,449,860

MINE ROOF SUPPORTS

Kunibert Becker, Werl; Burckhard Elsner, Lunen, and Rudiger Kirchbrucher, Dortmund-Brackel, all of Fed. Rep. of Germany, assignors to Gewerkschaft Eisenhutte Westfalia, Lunen, Fed. Rep. of Germany

Filed Apr. 12, 1982, Ser. No. 367,513

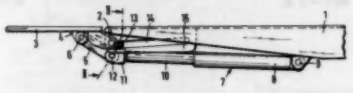
Claims priority, application Fed. Rep. of Germany, Apr. 22, 1981, 3115984

Int. Cl.³ E21D *17/054*

U.S. Cl. 405—293 **15 Claims**

1. In or for a mine roof support, a multipart extendible roof contacting structure comprising: a main roof-contacting structure (1), an auxiliary roof-contacting structure (3) pivotably connected to the main structure, and an appliance for pivoting

the auxiliary structure about the main structure between an operative position aligned with the main structure and an inoperative position stowed beneath the main structure, wherein said appliance employs at least one piston and cylinder unit (7) supported by the main structure, at least one pivotable guide lever (5) connected between the auxiliary structure and



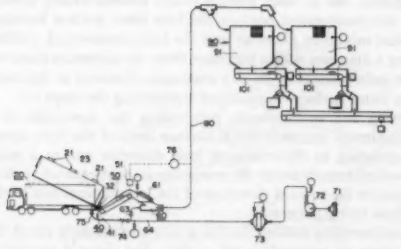
the piston and cylinder unit, and slidable guide means between the piston and cylinder unit and the main structure, and wherein the slidable guide means comprises guideways (14) on the main structure, and a guide member (13) slidably engaging in the guideways and coupled to the piston and cylinder unit for direct movement therewith.

4,449,861

SYSTEM FOR TRANSPORTING PLASTICS ARTICLES

Hisatoshi Saito; Shuzo Fujii; Itaru Takase; Akihiko Nakamura, and Yoshihiro Hara, all of Tokyo, Japan, assignors to Q.P. Corporation and Denka Engineering Kabushiki Kaisha, both of, Japan

Filed Feb. 9, 1982, Ser. No. 347,327
Int. Cl.³ B65G *51/02*
U.S. Cl. 406—39 **6 Claims**



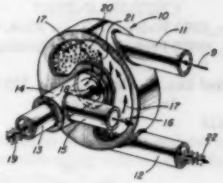
1. A system for transporting hollow plastics articles comprising in combination vehicle means for transporting the articles, said vehicle means having a tiltably mounted container which comprises heat-insulating walls and which is provided, at its upper portion, with a plurality of inlets for the articles and, at its rear portion, with an outlet for the articles and means for introducing pressurized air into said container, said tiltably mounted container being also provided, at the outlet thereof, with folding guide means comprising a bellows secured at one end to said rear portion and a pliable guide cylinder located on the inside thereof for guiding the articles to be discharged out of said container, a hopper device having a hopper adapted to be interconnected with said outlet through said folding guide means, a feed device coupled to said hopper device and arranged to convey the hollow plastics articles received from said hopper device, a pipeline through which the articles are transported and which comprises individual pipe sections, injector means interconnected with said feed device and said pipeline for pneumatically injecting into and conveying through said pipeline the articles conveyed from said feed device, said injector means and said pipeline being lined with a sheet of pliable and elastic material at least at their inner surfaces with which the articles may come into contact, and a storage device installed at the delivery end of said pipeline and having means for discharging the hollow plastics articles stored therein, said storage device comprising a storage having at its upper portion an inlet port to which the delivery end of said pipeline is connected and at its bottom portion an outlet port, and a belt conveyor located immediately under said outlet port, said storage also having baffle plates disposed therein and tilted at an angle of 20° to 30° in a zig-zag manner, respectively, each of the individual pipe sections of said pipeline having a square cross-section shape and being constructed such that at least one of the longitudinally extending walls thereof can be fully opened so that the linings of each said pipe section may be cleaned and repaired.

4,449,862

VORTEX INJECTION METHOD AND APPARATUS

Jeffrey L. Beck, Ponca City, Okla., assignor to Conoco Inc., Ponca City, Okla.

Filed Dec. 22, 1980, Ser. No. 218,857
The portion of the term of this patent subsequent to Oct. 18, 2000, has been disclaimed.
Int. Cl.³ B65G *53/30*
U.S. Cl. 406—93 **29 Claims**



18. A method of converting a low pressure slurry to a high pressure slurry comprising:

(a) injecting a high pressure fluid tangentially into a generally cylindrical chamber having a central axis, thus forming a low pressure vortex;

(b) removing a portion of said injected high pressure fluid along a path concentric to said central axis from said low pressure vortex;

(c) injecting a low pressure slurry along said central axis into said low pressure vortex wherein said low pressure slurry mixes with said high pressure fluid to form a high pressure slurry;

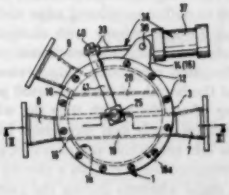
(d) separately removing said formed high pressure slurry tangentially from said chamber.

4,449,863

PIPE SWITCH FOR PNEUMATIC CONVEYING DEVICES

Klaus Ulliner, Braunschweig, Fed. Rep. of Germany, assignor to Bühler-Miag GmbH, Braunschweig, Fed. Rep. of Germany

Filed Jan. 19, 1982, Ser. No. 340,728
Claims priority, application Fed. Rep. of Germany, Jan. 24, 1981, 3102384
Int. Cl.³ B65G *53/56*
U.S. Cl. 406—182 **6 Claims**



1. A pipe switch for pneumatic conveyors, comprising a housing enclosing an inner space and being formed with a feeding connection for pulverized or granular material, and a plurality of discharging connections arranged opposite said

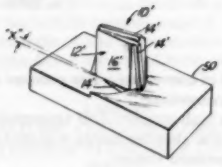
feeding connection; a plug disposed for rotation in said space and having a plurality of transverse channels corresponding in number to said discharging connections; control means coupled to said plug for rotating the same into a plurality of switching positions in which one of said channels connects said feeding connection to a selected discharge connection; sealing means embedded in said plug and including two closed loops surrounding respectively the inlets and the outlets of said channels in the plug, said sealing loops being spaced apart in circumferential direction from the adjoining sides of said inlets and outlets respectively about a distance which exceeds the breadth of said inlets and outlets in circumferential direction so that during rotation of said plug between said switching positions, the sealing loops do not override said adjoining sides of the inlets and outlets.

4,449,864

CONSUMABLE SELF-REGENERATIVE LEDGE CUTTING INSERT

Sazzadul Haque, 3290 Wolverine, Troy, Mich. 48084, and Terry A. Schroeder, 35905 Fredericksburg, Farmington Hills, Mich. 48018

Filed Dec. 7, 1981, Ser. No. 328,194
Int. Cl.³ B26D *1/00*
U.S. Cl. 407—113 **16 Claims**



1. A consumable self-regenerative ledge cutting insert comprising:

a planar body member having opposed, generally parallel surfaces which are spaced to define peripheral edge surfaces, at least one peripheral edge surface including an elongated, projecting ledge having improved cross-sectional configuration extending along the length thereof and formed unitary therewith, said ledge being of smaller width that the width between the spaced surfaces of the body member and defining a cutting edge of the cutting insert whereby during a cutting operation one end of the elongated ledge continually contacts a workpiece and is continuously consumed so as to define a new cutting edge along the length of the ledge, the ledge having angled, tapered or arcuate cross-sectional geometric configuration.

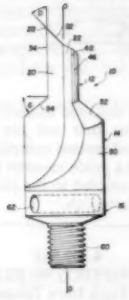
9. An indexable consumable self-regenerative ledge cutting insert comprising a planar body member of generally rectangular configuration including opposed, generally parallel surfaces which are spaced to define peripheral edge surfaces, said planar body member formed unitary with elongated projecting ledges respectively extending from each said peripheral edge surface, each elongated projecting ledge extending along at least a portion of the length of the associated peripheral edge surface and being of smaller width than the width of the peripheral edge surface, each said elongated ledge extending diagonally across said respective peripheral edge surface such that each said elongated ledge defines a cutting edge disposed at a radial rake angle whereby during the cutting operation, one end of an elongated ledge continually contacts the workpiece and is continuously consumed in a manner to define a new cutting edge along the length of said ledge until such time as the ledge is consumed, after which the cutting insert may be indexed to the next ledge cutting edge.

4,449,865

METHOD AND TOOL FOR GENERATING COUNTERSUNK HOLES IN COMPOSITE MATERIALS

Alexander Yankovoy, and Theodore Ozer, both of Wallingford, Pa., assignors to The Boeing Company, Seattle, Wash.

Filed Nov. 18, 1981, Ser. No. 322,625
Int. Cl.³ B23B *35/00, 51/00*
U.S. Cl. 408—1 R **8 Claims**



7. A method of generating a countersunk hole in a composite of at least a first material and a second material having a higher modulus of elasticity than the first material, the hole being generated having a longitudinal axis, a countersunk portion which extends axially inward from an outer surface of the composite, and an inner portion which extends axially inward from the countersunk portion, the hole inner portion having a constant minimum diameter and the hole countersunk portion having a diameter which increases from the minimum diameter at the hole inner portion to a maximum diameter at the composite outer surface, the method comprising the steps of:

cutting and continuously penetrating the composite at a minimum circumferential surface limit of the hole corresponding to the minimum hole diameter and at a point which travels about the minimum circumferential surface and in the inward direction of the longitudinal axis of the hole being generated;

simultaneously cutting the composite continuously about the minimum circumferential surface and along a revolving radius of the hole being generated, wherein the revolving radius is inclined relative to the longitudinal axis of the hole; and

cutting the composite continuously along at least one revolving, radially-extending line which also travels in the inward direction of the hole axis, the revolving line being inclined relative to the hole axis so that the composite is progressively cut along said revolving line, starting at the junction of the hole minimum circumferential surface and the composite outer surface, said revolving line travelling axially inward until a point of the revolving line adjacent the composite outer surface cuts the composite along a maximum circumferential surface limit corresponding to the maximum hole diameter.

4,449,866

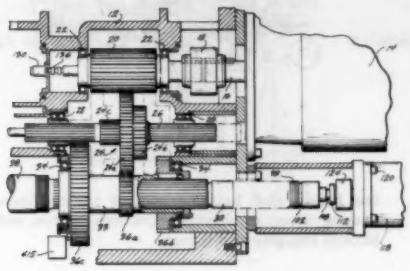
SERVO-CONTROLLED SPINDLE DRIVE SYSTEM

Earl R. Lohneis, Milwaukee, and Richard E. Stobbe, Greenfield, both of Wis., assignors to Kearney & Trecker Corporation, West Allis, Wis.

Filed Jul. 24, 1981, Ser. No. 286,371
Int. Cl.³ B23B *47/14, 47/22*; F16H *5/16*
U.S. Cl. 408—9 **4 Claims**

1. In a spindle drive system for driving a machine tool spindle that is adapted to carry a rotary cutting tool; an electric motor having an output shaft; a transducer coupled directly to said output shaft for rotation in unison therewith; a gear train connected to transmit the drive from said output shaft to said spindle; a shiftable gear in said gear train for meshing engage-

ment with any one of a plurality of gears selectively for varying the speed of said spindle; and retaining means in said gear train for retaining the individual gears of said gear train locked against rotation relative to each other during the movement of



said shiftable gear so that the gears always remain in the same rotary position relative to each other to retain the constant synchronism between said transducer and the spindle.

4,449,867

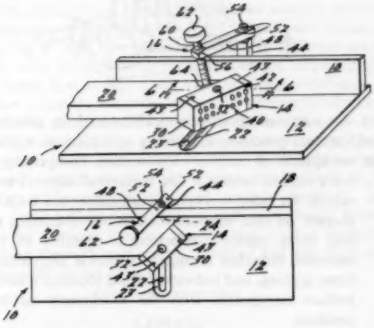
DOWEL DRILL FIXTURE

Stephen J. Dergo, 7821 Timor St., Long Beach, Calif. 90808

Continuation-in-part of Ser. No. 100,504, Dec. 5, 1979, Pat. No. 4,332,514. This application May 25, 1982, Ser. No. 381,681

Int. Cl.³ B23B 47/28

U.S. Cl. 408—103 **12 Claims**



1. A drill fixture comprising:

a base plate having a slot therein;

a drill guide block having at least one first pair of bores adapted to guidingly receive a drill bit therein and a second bore adapted to receive a pivot means therein;

pivot means located in said second bore and slidably received in said slot for pivotally attaching said drill guide block to said base plate; said pivot means including slide locking means for selectively fixing the position of said pivot means in said slot without interfering with the pivoting of said drill guide block; and pivot locking means for selectively fixing the pivotal position of said drill guide block.

4,449,868

APPARATUS FOR THREADING HOLES

Karl Steinsberger; Albert Maier, and Walter Herrmann, all of Munich, Fed. Rep. of Germany, assignors to AGFA-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Dec. 22, 1981, Ser. No. 333,577

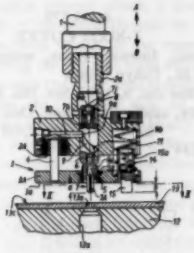
Int. Cl.³ B23Q 5/027; B23G 3/04

U.S. Cl. 408—138 **22 Claims**

1. Apparatus for threading a tapping hole having internal projections which alternate with recesses for externally threaded ridges of a fluted tap, said apparatus comprising:

(a) a hold-down device having a side movable against a workpiece provided with a tapping hole to be threaded, said device also having an internally threaded portion;

(b) a holder mounted for rotation and having external threads meshing with the internal threads of said internally threaded portion so that rotation of said holder entails axial movement thereof and said holder is guided by said device;



(c) a tap mounted in said holder and having substantially parallel flutes alternating with substantially parallel, externally threaded ribs;

(d) a carrier for said device movable with reference to the latter;

(e) cooperating guide means on said carrier and said holder arranged to rotate said holder in response to relative movement of said carrier and said device; and

(f) limiting means for limiting rotation of said holder to a predetermined angle which corresponds to a fractional revolution of said tap.

4,449,869

DEVICE FOR THE MANUFACTURE OF GEAR WHEELS FOR LOW NOISE GEARINGS

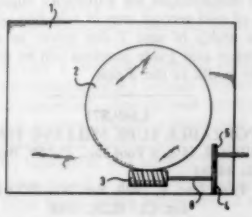
Kurt Maier, Karlsruhe, Fed. Rep. of Germany, assignor to BHS-Dr. Ing. Hofler Maschinenbau GmbH, Ettlingen-Oberweier, Fed. Rep. of Germany

Filed Nov. 6, 1980, Ser. No. 204,542

Claims priority, application Fed. Rep. of Germany, Dec. 21, 1979, 2951876

Int. Cl.³ B23F 5/22

U.S. Cl. 409—11 **15 Claims**



1. In a gear cutting machine including a cutter support, a cutter and cutter drive, a work support, a work support drive and a gear train interconnecting said cutter drive and said work support drive for synchronous rotation of said cutter and a workpiece, said work support drive including a workslide (1), an indexing worm gear (2) mounted on said workslide and driven by a worm (3) mounted on a worm shaft (8) driven by at least one gear wheel (4) and a drive gear (5), said shaft including an extension portion (20) terminating in a threaded

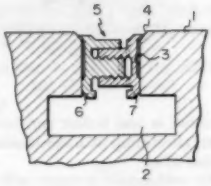
section (21) configured to receive a locking nut (22) thereon; an eccentric socket (12) mounted on said extension portion and adjustably supporting said gear wheel (4) thereon for relative rotative adjustment with respect thereto, and locking means selectively interconnecting said shaft, said eccentric socket and said gear wheel in a selected relative position and against relative rotation with respect to each other, whereby the eccentric mounting of the gear wheel may be adjusted to produce cyclic variation of the work rotation with respect to the cutter.

4,449,870

T-SLOT COVER

Masakazu Suzuki, Ibaraki, Japan, assignor to Suzuki Iron Works Co., Ltd., Tokyo, Japan

Filed Jul. 9, 1982, Ser. No. 396,862
Claims priority, application Japan, Oct. 29, 1981, 56-173464
Int. Cl.³ B23Q *11/08*
U.S. Cl. 409—134 **5 Claims**



1. A T-slot cover for covering generally inverted T-shaped slots (T-slots) in such as a table of a machine tool, said cover comprising two elongated section members, each of said section members having in the crosssection a vertically extending web having a sidewisely and outwardly projecting projection for engaging with a chamfered upper edge portion of said T-slot thereby retaining the T-slot cover in the T-slot, and a sidewisely and outwardly projecting guide portion on the lower end portion thereof for engaging with the side wall of said T-slot, one of said section members having in the crosssection a sidewisely and inwardly extending first arm defining generally flat upper and lower surfaces and a sidewisely and inwardly extending second arm spaced downwards from said first arm and defining thereon saw tooth or wave like indentations, the other of said section members having in the crossection a sidewisely and inwardly extending arm defining on the upper surface thereof a generally flat surface for slidably engaging with the flat lower surface of said first arm of said one section member and on the lower surface thereof correspondingly shaped indentations for adjustably engaging with said indentations of said second arm of said one section member, whereby the width of said T-slot cover as defined by the distance between said guide portions can be adjusted to conform with the width of the T-slot.

4,449,871

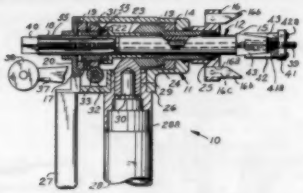
PORTABLE TUBE MILLING TOOL

Tollief O. Hillestad, H & S Tool Inc., 212 W. Bergey St., Wadsworth, Ohio 44281

Filed Dec. 8, 1980, Ser. No. 213,814
Int. Cl.³ B23C *3/00*
U.S. Cl. 409—178 **7 Claims**

1. A portable tube milling machine, comprising:

in combination, a housing, a hollow shaft received in said housing, a collet removably received on said hollow shaft for locking and centering said hollow shaft in a boiler tube that is to be machined, while in a boiler, a drive gear freely rotatably received on said hollow shaft and in engagement with a gear secured to a motor secured to said housing, a hand crank with gear means secured to said housing for controlling the rate of feed of a cutting tool holder, said holder being secured to, and driven by, said drive gear, and a feed nut matingly engaging the periphery of said hollow shaft for advancing said hollow shaft in said housing and in said drive gear, by means of said hand crank,



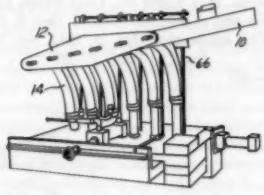
said hollow shaft having splines on one end thereof, a housing closure cap having projections thereon, said projections engaging said splines.

4,449,872

BROACHING MACHINE

Leonard A. Gabriele, Warren, Mich., assignor to Lear Siegler, Inc., Santa Monica, Calif.

Filed Jun. 1, 1981, Ser. No. 269,311
Int. Cl.³ B23D *37/10, 41/06*
U.S. Cl. 409—252 **29 Claims**



1. An automatic precision machine tool for simultaneously performing a precision machining operation on a plurality of flat workpieces of circular cross-section, comprising

a work station having a flat horizontal support surface on which flat sided workpieces are supported with flat sides thereof on said support surface, metal-cutting means at said work station comprising a plurality of vertically movable broaches arranged in lateral alignment at uniform spacing, and individual fixed locating means on said surface engageable with the workpieces in broaching position,

loading means comprising an elongated inlet guide along which a solid array of workpieces is advanced with the flat sides thereof in vertical planes and edges in contact, a stop engaging the leading workpieces in said inlet guide, said workpieces being dimension such that nonconsecutive workpieces are in approximate alignment with said individual locating means and corresponding broaches, turnover means including an arcuate turn-over means extending through an arc of 90° having an upper horizontally presented inlet and a lower vertically arranged outlet, pusher means for pushing non-consecutive workpieces spaced apart distances approximating the spacing of said broaches and individual locating means from said inlet guide into the inlet of said turn-over means to deposit the plurality of workpieces on said support surface spaced from said individual fixed locating means, means for advancing the workpieces over said surface into engagement with said locating means

means for actuating said broaches, and

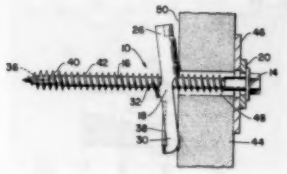
unloading means comprising an elongated outlet guide, and means operable after actuation of said broaches for displacing the finished workpieces from said work station to said outlet guide.

4,449,873

FASTENER FOR ATTACHING ARTICLES TO A PENETRABLE SURFACE

Gerald D. Barth, South Elgin, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed Feb. 25, 1982, Ser. No. 352,281
Int. Cl.³ F16B *21/00*
U.S. Cl. 411—341 5 Claims



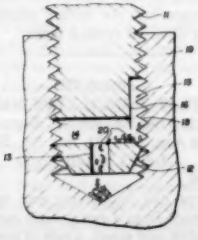
1. A fastener assembly for attaching articles to a penetrable surface comprising a threaded fastener having a threaded shank and an anchor member piercedly capturing said threaded shank, said anchor member lying in a first position substantially parallel to the axis of said threaded shank and partially embracing said threaded shank while said fastener, carrying said anchor member, pierces said surface, said threaded shank having a length sufficiently greater than the length of said anchor member to allow said threaded shank to extend beyond both ends of said anchor member when said anchor member is in said first position; said anchor member further having spring means for aiding rotation of said anchor member from said first position after said anchor member has passed fully through said surface to a second position substantially oblique to the axis of said threaded shank; said threaded shank having at least two thread segments of different major diameters with the thread segment having the largest major diameter being first to pierce said surface during installation of the fastener assembly whereby when said fastener is subjected to a force in a direction to retract said fastener through said surface after said anchor member has rotated toward said second position and said anchor member is brought to bear against said surface, thereby positioning said fastener to be threadedly advanced through said anchor member, said threaded shank will be prevented, by said larger major diameter threaded segment bearing against said anchor member, from pulling through said anchor member and allowing said anchor member to fall free.

4,449,874

SELF-THREADING BOLT

Blake McKinney, P.O. Box 67, Marietta, Ohio 45750

Filed Dec. 1, 1981, Ser. No. 326,185
Int. Cl.³ F16B *25/00*
U.S. Cl. 411—418 1 Claim



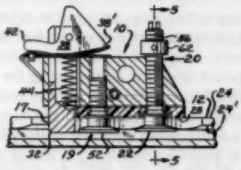
1. A threaded fastener adapted to recut damaged or imperfect metal screw-threads in a threaded opening into which the fastener is inserted, the fastener comprising a uniform diameter screw-threaded shank having standard metal threads, the shank being provided in its forward end with a central axial opening terminating somewhat rearwardly from said forward end, the shank also having a transverse through opening at right angles to the central axial opening and intersecting the central axial opening somewhat rearwardly of the forward end of the shank, the central axial opening and transverse through opening being in open communication and the transverse through opening forming the rear terminus of the central axial opening, and the shank further being provided in its threaded periphery with a longitudinal uniform depth substantially rectangular cross-section groove which is somewhat deeper than the radial depth of the screw-threads on the shank, said groove being of the same width as the transverse through opening and intersecting the latter at right angles and being in open communication with the transverse through opening, said groove starting from the forward side of the transverse through opening and extending longitudinally rearwardly on the shank to a point substantially rearwardly of said through opening, whereby metal particles produced during the installation of said fastener into a threaded opening may collect in said groove and pass from the forward end of the groove into the transverse through opening and from the latter into and through the central axial opening for collection in the bottom of the screw-threaded opening.

4,449,875

SEAT BACK MOUNTING SYSTEM

René J. Brunelle, Wolcott, Conn., assignor to UOP Inc., Des Plaines, Ill.

Filed Jul. 22, 1982, Ser. No. 400,785
Int. Cl.³ B60P *1/64*; B63B *25/24*
U.S. Cl. 410—80 4 Claims



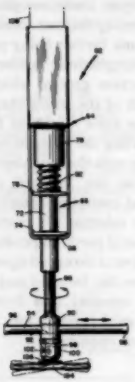
1. A track fitting assembly for anchoring a load to a slotted floor track in an aircraft or other conveyance, said slotted floor track having lips defining said slot, said assembly comprising an elongated housing having at least two headed studs extending downwardly therefrom and a shear pin movable vertically into and out of engagement with the floor track, one of said headed studs having a helically threaded shank portion in engagement with complementary threads formed in a vertical aperture passing completely through said housing, the upper end of said shank portion extending above said housing and being slotted to permit said one stud to be manually rotated and moved vertically relative to said housing after said studs and shear pin have been placed in operative engaging relationship with a slotted floor track, collar means affixed to said shank portion, said collar means being adapted to engage an upper surface of said housing to limit downward movement of said one headed stud when said shank portion is rotated in a first direction, said collar means being movable vertically upwardly with said shank portion away from said housing when said shank portion is rotated in a second direction, said movement in said second direction causing the upper surface of the headed portion of said one headed stud to contact the undersurface of lip portions of said slotted track and thereby force the housing into firm engagement with said slotted track.

4,449,876

CARGO BRACE

Thomas J. Glanton, Oxford, Ga., assignor to Guelda Gene Glanton, Conyers, Ga.

Filed Sep. 14, 1981, Ser. No. 302,187
Int. Cl.³ B50P 7/14; B51D 45/00
U.S. Cl. 410—151 36 Claims



1. A brace, comprising:

a rod;

an elongate bar;

a substantially elongate casing having a first end portion and a second end portion, the first end portion comprising spaced walls defining a box-like receptacle open at said first end portion of said casing, one end of the bar being received within the box-like receptacle and extending outwardly of the casing in a direction essentially parallel to the longitudinal axis of the rod to engage a surface of an object against the free end of the bar, thereby extending the effective length of the brace;

means disposed interiorly of the casing for precluding communication between the bar and the rod;

means carried by the casing at the second end portion thereof and receiving a portion of the rod for maintaining the rod in position relative to the casing when the rod is at rest and for allowing displacement of the rod relative to the casing on movement of the rod to cause the length of the combined rod and the casing to vary, at least the free end of the rod extending beyond and externally of the second end portion of the casing, the rod being threaded along at least a portion of its length engaging the maintaining means and at least a portion of the maintaining means being threaded to matingly receive the threaded portion of the rod thereinto to cause displacement of the rod relative to the casing on relative rotation of the rod and of the maintaining means;

a foot plate carried by the free end of the rod;

a housing mounted to an inner surface of the foot plate and having an aperture formed centrally therein to freely receive the distal end of the rod therethrough;

means formed on the distal end of the rod and disposed within the housing for retaining the distal end of the rod within said housing, the foot plate being freely mounted for rotation on the rod; and,

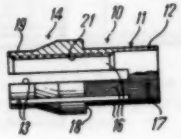
means formed on the rod proximate to the housing for facilitating rotation of the rod, the last-mentioned means comprising a nut permanently mounted to the rod and being disposed adjacent the housing in abutting relation thereto and transmitting force from the rod to the foot plate through the housing, the nut being engageable with a wrench or similar tool to allow rotation of the rod.

4,449,877

PEG FOR ENGAGEMENT IN COUNTERSUNK SECTION OF A BORE

Juergen Kessler, Stuttgart, Fed. Rep. of Germany, assignor to Hilti Aktiengesellschaft, Fed. Rep. of Germany

Filed Apr. 21, 1980, Ser. No. 142,256
Claims priority, application Fed. Rep. of Germany, May 2, 1979, 2917611
Int. Cl.³ F16B 13/00, 13/08
U.S. Cl. 411—57 2 Claims



1. A peg for implantation in a bore in a masonry, brickwork and the like, which bore is provided internally with a radial enlargement, said peg comprising an axially elongated sleeve having an inner thread for receiving a fastening screw and said sleeve having a leading end arranged to be inserted first into the bore and a trailing end, said sleeve comprising a leading part longitudinally slotted from the leading end to provide a plurality of axially extending segments separated by axial slots terminating between said leading end and trailing end, a trailing annular part extending from the end of said slots closer to said trailing end toward said trailing end, said sleeve having a relaxed condition and a flexed condition where said segments are compressed radially inwardly from the relaxed condition, said leading part having a greater outside diameter, in the relaxed condition than said adjoining trailing annular part of the sleeve, the outside diameter of said leading part being variable in the flexed condition to enable said segments forming said leading part to be pushed into the bore and to be released into the relaxed condition and snapped into the enlargement in the bore to inhibit withdrawal of the peg from the bore, characterized therein that the annular trailing part and the leading part of the sleeve are integral and the leading part is provided externally and segmentally with an axially extending annular radially thickened section, said leading part of the sleeve is provided integrally at the leading end toward the radially thickened section with an axially extending cylindrically shaped extension segmented by the axial slots, the outer diameter of said extension in the relaxed condition being equal to the diameter of the annular trailing part and being less than the diameter of said radially thickened section, and that the said inner thread is provided in the axial region of the leading part including the extension of the sleeve, and in its relaxed condition, said sleeve is of substantially the same inner diameter over the complete axial length thereof, said segments of the leading part are integrally connected through bridge pieces with a ring forming at least part of the trailing part, and the leading part merges into the bridge pieces through a steep radially inwardly directed conical taper.

4,449,878

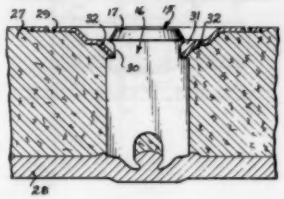
FLAT CLINCH TYPE NAIL

Robert L. Hallock, 7136 NE. 8th Dr., Boca Raton, Fla. 33432

Filed Aug. 31, 1981, Ser. No. 298,222
Int. Cl.³ F16B 15/00
U.S. Cl. 411—495 8 Claims

1. A clinch type nail for driving into metal comprising a shank which is made from a metal stock material, head means formed at one end of said shank, a pair of separate spaced apart penetrating portions formed at the other end of said shank, each of said penetrating portions having inner and outer side walls, said inner and outer side walls of each of said penetrating portions being disposed at an angle relative to one another and

intersecting one another so as to form generally straight line penetrating edges, said generally straight line penetrating edges of said penetrating portions extending generally parallel with respect to one another, said outer side walls of said penetrating portions being inclined toward the elongated axis of said shank as they extend toward said straight line penetrating edges, said outer side walls of each of said penetrating portions



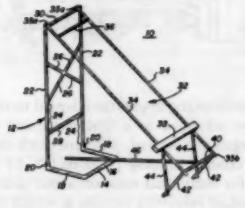
being inclined toward the elongated axis of said shank toward the straight line penetrating edges at a greater angle than said inner walls of said penetrating portions, said outer side walls presenting a greater resistance to penetration of the metal than said inner side walls, whereby when the nail is driven into the metal the greater resistance to penetration of said outer side walls causes said penetrating portions to clinch inwardly toward each other capturing a strip of metal therebetween.

4,449,879

DRY WALL LIFT

James E. Mercer, Dallas, Tex., assignor to Henry A. McAdams, Dallas, Tex., a part interest

Filed Mar. 22, 1982, Ser. No. 360,369
Int. Cl.³ E04F *21/18*
U.S. Cl. 414—11 **1 Claim**



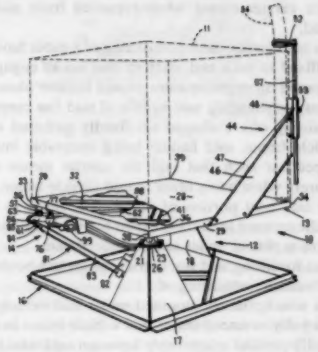
1. A dry wall panel lift with work frame comprising:
(a) a vertical support having spaced apart legs of about ceiling height and at least two crossbars, one at ceiling height and one at worktable height;
(b) a work frame having a pivotal detachable connection at one end thereof to one of said crossbars and having legs of worktable height at the other end thereof extending away from a work surface of said frame;
(c) a stiff leg pivotally connected to the end of said work frame opposite said connection and of length about equal ceiling height; and
(d) a work stop extending across said work frame in the region remote from said connection whereby with one end of said work frame lowered to slope downwardly from said connection, said stop will support a ceiling panel on said work frame preparatory to elevating said panel to ceiling height, said work frame being connectable to either of said bars for selectively functioning as a ceiling panel lift or for a worktable support.

4,449,880

TILTABLE PLATFORM

John E. Hartman, Park, Mich., assignor to National Bulk Equipment, Inc., Holland, Mich.

Filed Sep. 30, 1982, Ser. No. 430,163
Int. Cl.³ B65G *65/30*
U.S. Cl. 414—421 **12 Claims**



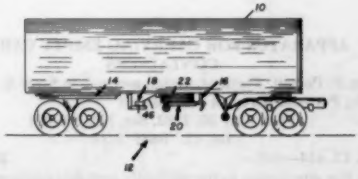
1. An apparatus for supporting a load, comprising a base, support means adapted to support the load and supported on said base for movement between first and second positions, said support means becoming increasingly tilted with respect to a horizontal reference as it moves from said first to said second position, drive means cooperable with said support means for effecting said movement thereof between said first and second positions, and control means cooperable with said drive means for automatically actuating said drive means to effect movement of said support means toward said second position in response to a shift in the distribution of the load on said support means, whereby said support means becomes increasingly tilted and the force of gravity effects a redistribution of the load thereon.

4,449,881

REMOVABLE TIRE CARRIER

Joseph E. Lane, 1204 Dorchester Ave., Baltimore, Md. 21207

Filed Jan. 19, 1982, Ser. No. 340,816
Int. Cl.³ B62D *43/04*
U.S. Cl. 414—428 **2 Claims**



1. A spare tire carrier for wheeled vehicles to be positioned under the vehicle frame, comprising:
a tire carrier means for transporting said spare tire when removed from said vehicle, and for supporting said spare tire securely against said vehicle frame when lifted into a position under said vehicle, consisting of:
(a) a load supporting frame, consisting of a frame and a bottom plate, for supporting said spare tire, the side surface of said spare tire resting on the front face of said frame, the edge of said spare tire resting on said bottom plate;

(b) a handle containing a tubular shaft having a straight portion and a portion bent away from the front face of said supporting frame fixedly connected to said straight portion, the upper end portion of said load supporting frame acting as a handle when said tire carrier means is removed from said wheel;

(c) two wheels mounted on opposite sides of the lower portion of said load supporting frame, for wheeling said tire carrier means when removed from said vehicle; and,

(d) a connecting means consisting of a cable having hooks affixed to each end, each of said hooks engaging holes spaced on opposite sides of said bottom plate;

a means for engaging said handle of said tire carrier means, consisting of a U-shaped bar fixedly mounted under said vehicle frame, said handle being insertable into said U-shaped bar such that said tire carrier means can pivot securely when being lifted to said vehicle frame, and such that said bent portion of said handle tends to keep said handle secured in said U-shaped bar when said tire carrier means is placed under said vehicle frame;

a means for lifting said tire carrier means to a position under said vehicle, consisting of:

(a) a winch, fixedly mounted under said vehicle frame;

(b) a pully mounted under said vehicle frame in a substantially parallel relationship between said winch and said engaging means;

(c) a cable running through said pulley, having one end attached to said winch and the other end attached to a hook, said hook engageable with said connecting means on said tire carrier means; and,

a means for locking said spare tire consisting of:

(a) a hanger, fixedly mounted under said vehicle frame in a first area adjacent to the outer circumference of said spare tire, when said spare tire is lifted under said vehicle;

(b) a U-bolt, fixedly mounted under said vehicle frame, at a second area on said vehicle frame adjacent to said spare tire outer circumference, said second area being oppositely disposed along said spare tire circumference from said first area; and,

(c) a locking bar which fits around said tire carrier means and said spare tire, when said tire carrier means is lifted under said vehicle, having one end to engage said hanger and the other end to engage said U-bolt.

4,449,882

APPARATUS FOR CARRYING EMPTY CARGO CONTAINERS

Lynn F. Perrott, Portland, Oreg., assignor to Scott S. Corbett, Jr., Portland, Oreg., a part interest

Filed May 20, 1982, Ser. No. 380,051
Int. Cl.³ B66F 9/14
U.S. Cl. 414—665 **20 Claims**

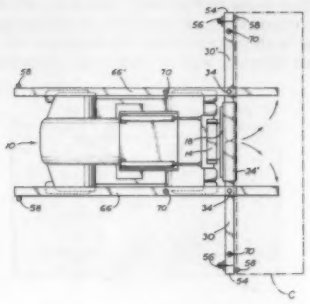
1. For attachment to the vertically movable carriage of a lift truck or other vehicle, a cargo container carrier comprising:

(a) a main frame arranged for removable attachment to the vertically movable carriage of a vehicle,

(b) laterally spaced, vertically extending pivot means mounted on said frame,

(c) a container lifting beam configured in two sections each supported on one of said pivot means for pivotal adjustment of the beam sections between an operative position of longitudinal extension and a retracted position extending substantially parallel to each other adjacent opposite sides of the vehicle,

(d) locking means on the beam sections for releasably securing them together in said operative position, and



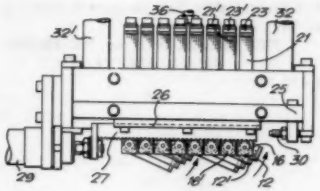
(e) container connecting means on the beam sections arranged to releasably engage a cargo container.

4,449,883

CONTACT POSITIONING APPARATUS

Georg Kampfmann, Darmstadt-Eberstadt, Fed. Rep. of Germany, assignor to AMP Incorporated, Harrisburg, Pa.

Filed Mar. 22, 1982, Ser. No. 360,141
Claims priority, application United Kingdom, Mar. 24, 1981, 8109205
Int. Cl.³ B65G 47/26
U.S. Cl. 414—744 A **3 Claims**



1. Contact positioning apparatus adapted to receive a plurality of contacts arranged at a first pitch and to deliver the contacts arranged at a second, different pitch characterised by a plurality of contact holding portions (11, 11') mounted in a carriage (19) for individual rotation about different radii (13, 13') from a contact receiving portion in which they are spaced at the first pitch and a contact delivering position in which they are spaced at the second pitch, the contact holding portions (11, 11') extending perpendicularly from first ends of respective arms (13, 13') and being mounted in aligned coplanar relation, the arms (13, 13') being of progressively increased length and arranged in parallel relation, second ends of the arms (13, 13') being mounted for rotation about parallel axes (14, 14') perpendicular to the arms (13, 13') which are staggered axially.

4,449,884

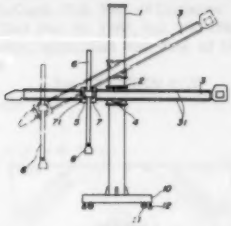
UNIVERSAL ROBOT

Kenro Motoda, Tokyo, Japan, assignor to Motoda Denshi Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 25, 1981, Ser. No. 305,853
Claims priority, application Japan, Nov. 25, 1980, 55-165653
Int. Cl.³ B25J 5/04
U.S. Cl. 414—749 **6 Claims**

1. A universal robot wherein an X-axis arm is mounted on a support means provided on a post and a Z-axis arm is mounted

on a slider slideable on the X-axis arm in the longitudinal direction thereof, said X-axis arm having a length, which robot is characterized in that said X-axis arm is mounted solely on said support means through a rotating mechanism which is rotatable into and lockable in a desired position, said X-axis



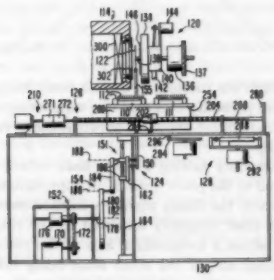
arm extends in opposite directions on both sides of said post, said Z-axis arm is mounted on said slider through a rotating mechanism which is rotatable into and lockable in a desired position, said slider is slideable along the entire length of said X-axis arm, and said support means is mounted on said post moveably in the vertical direction.

4,449,885

WAFER TRANSFER SYSTEM

Richard J. Hertel, Bradford, and Edward D. MacIntosh, Gloucester, both of Mass., assignors to Varian Associates, Inc., Palo Alto, Calif.

Filed May 24, 1982, Ser. No. 381,085
Int. Cl.³ B65G *1/00*
U.S. Cl. 414—750 **11 Claims**



1. In an automated wafer transfer system, apparatus for accurately positioning a cassette of the type having outwardly extending ribs along opposite sides thereof for access to individual wafers from below by a vertical wafer lift mechanism, said apparatus comprising:

a cassette holder comprising

a housing having a generally open top and bottom for access by said lift mechanism,

cassette adaptor means including an adaptor plate mountable to the top of said housing and having an aperture corresponding in size to said cassette and cassette support means positioned for support of the cassette in said aperture by said outwardly extending ribs, and

cassette retention means including a spring-loaded retention bar operative to bear against an end of the cassette and to retain it in a predetermined position in said cassette holder; and

means for positioning said cassette holder relative to said vertical wafer lift mechanism.

4,449,886

APPARATUS FOR FINING BOTTLED WINE

John Kalua, 3416 Solano Blvd., Napa, Calif. 94558

Filed Mar. 17, 1982, Ser. No. 359,159
Int. Cl.³ C12G *1/00*
U.S. Cl. 414—776 **15 Claims**

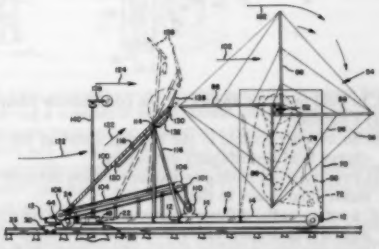
1. An apparatus for rotating and tipping a large plurality of bottles filled with wine, comprising a base frame, a pair of stanchions extending upwardly from said base frame, a support frame disposed between said stanchions, first means for joining said support frame to said stanchions in pivotal fashion to rotate about a first axis, a housing disposed within said support frame and adapted to support a large plurality of bottles disposed with their longitudinal axes extending in parallel fashion, second means for joining said housing to said support frame in pivotal fashion about a second axis, said second axis being non-parallel to said first axis, means for rotating said support frame about said first axis, including a pair of telescoping strut assemblies extending between said base frame and said support frame, each of said pair of strut assemblies including a first telescoping member secured at one end to said base frame, a second telescoping member slidably received in said first member and having a distal end pivotally joined to said support frame, a threaded shaft extending through said first and second telescoping members, means secured to said second telescoping member for engaging the threads of said shaft, and means for rotating said housing about said second axis.

4,449,887

HORIZONTAL AXIS WINDMILL

Ivan W. Mundhenke, 11390 SW. Ironwood Loop, Tigard, Oreg. 97223

Filed Sep. 14, 1981, Ser. No. 301,879
Int. Cl.³ F03D *7/06*
U.S. Cl. 415—4 **1 Claim**



1. A windmill comprising

a base frame having opposite ends and front and rear portions,

horizontal shaft means supported on said frame,

a wind driven member secured on said shaft means,

said wind driven member including a plurality of elongated longitudinally extending vanes projecting radially from said shaft means and having wind engaging surfaces,

said vanes comprising lightweight framing and being braced one with the other by tie lines,

said vanes having a wind driving position on one side of said shaft means and having a return position on the other side of said shaft means,

a wind deflecting member disposed at the front of said base frame protecting the return position of said vanes from the wind and having an upwardly disposed face surface terminating in top and bottom longitudinal edges, with said top edge positioned such that deflected wind is arranged to engage said wind driven member for driving the latter,

a transverse support on said base frame guiding said wind deflecting member adjacent the top edge of the latter in a pivoting slidable connection,

drive means on said base frame supporting said wind deflecting member at the bottom thereof and arranged to move the bottom of said wind deflecting member toward or away from said wind driven member,

said drive means being inclined upwardly in a direction toward said wind driven member,

said drive means, upon moving the bottom edge of said wind deflecting member toward said wind driven member, causing the top edge of said wind deflecting member to pivot rearwardly on said transverse support and to move upwardly and away from said wind driven member, thus controlling the deflection of the wind and the exposure of said wind driven member to the wind by actuation of said drive means,

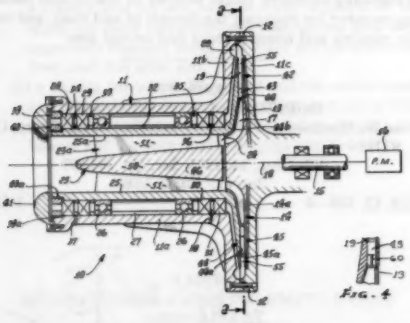
and a pivotal blade extension on the upper end of said wind deflector means.

4,449,888

FREE SPOOL INDUCER PUMP

Otto E. Baljé, 3363 Charleston Way, Los Angeles, Calif. 90068

Filed Apr. 23, 1982, Ser. No. 371,258
Int. Cl.³ F04D *29/44*
U.S. Cl. 415—143 **4 Claims**



1. In fluid pumping apparatus, the combination comprising

(a) a housing,

(b) an impeller rotable in the housing about an axis to discharge fluid centrifugally outwardly,

(c) a rotary spool having an inducer section through which intake fluid passes to the impeller,

(d) a rotary radial diffuser connected with the rotary spool and having driving vanes located at the inlet of the diffuser and outwardly of the impeller periphery for rotatably driving the spool in response to outward flow of said discharged fluid against and between the vanes,

(e) said driving vanes having inner ends substantially adjacent the impeller periphery, and outwardly thereof,

(f) said impeller having blades which spiral radially and circumferentially outwardly in one rotary direction about the impeller axis, said driving vanes spiralling radially and circumferentially outwardly in the opposite rotary direction about said axis and from said inner ends, and entirely outwardly of the impeller,

(g) said spool at all times being rotatable free of connection to the impeller,

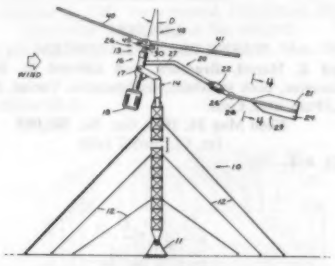
(h) there being Tesla ring means on the spool and located radially of the driving vanes.

4,449,889

WINDMILL

Ralph A. Belden, 4th Floor #2, Lane 141, Chung-Shan N. Rd., Sec. 7, Taipei, Taiwan

Filed Jan. 20, 1983, Ser. No. 459,367
Int. Cl.³ F03D *7/00*
U.S. Cl. 416—16 **17 Claims**



1. A windmill for rotating in a wind comprising:

a pivot head pivotally mounted to a supporting structure for pivotal movement about an approximately vertical pivot head axis;

a tilting assembly having a rotor head which is pivotally connected to the pivot head of an approximately horizontal tilt pivot, the tilting assembly further comprising:

(a) a rotor shaft rotatably mounted to the rotor head for rotation about a longitudinal axis of the rotor shaft; said longitudinal axis of the rotor shaft being oriented in an upstanding position and inclined backwardly toward said vertical pivot head axis;

(b) at least one rotor blade connected to the rotor shaft in an approximately transverse relationship to the longitudinal axis of the rotor shaft; said rotor blade having a cross-sectional shape forming an airfoil; said airfoil having a negative angle of attack with respect to a plane perpendicular to the longitudinal axis of the rotor shaft;

(c) a control tail connected to the rotor head and extending outwardly therefrom beneath the rotor blade in order to catch the wind and orient the rotor shaft so that it inclines backwardly in the direction the wind travels; the control tail also including at least one vane thereon opposite from the rotor head; said vane being properly shaped and oriented to generate an increasing lifting force when exposed to increasing velocity winds to automatically tilt the tilting assembly into more upright positions to reduce aerodynamic forces on the rotor blade, automatically controlling the rotational speed of the rotor under varying wind conditions.

4,449,890

DEVICE FOR CONTROLLING A LIQUID METAL FLOW IN A TUBE

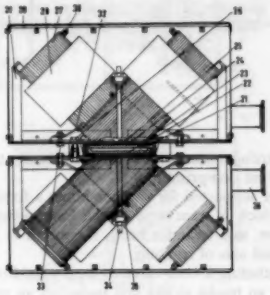
Joachim Barzantny, Kürten-Eichof; Joachim Beake, Bergisch Gladbach; Rainer Hans, Bergisch Gladbach, and Theodor Lauhoff, Bergisch Gladbach, all of Fed. Rep. of Germany, assignors to Siemens Interatom, Intl. Atomreaktorbau GmbH, Bergisch-Gladbach, Fed. Rep. of Germany

Filed Jun. 10, 1980, Ser. No. 158,240

Claims priority, application Fed. Rep. of Germany, Jun. 15, 1979, 2924116

Int. Cl.³ H02N *4/20*

U.S. Cl. 417—50 6 Claims



1. Device for controlling a liquid metal flow in a tube having a substantially rectangular cross section with two relatively elongated and two relatively short sides comprising a plurality of comb-like slotted magnet cores grouped at the two relatively elongated sides of the tube and extending parallel to the flow direction of the liquid metal, electromagnetic coils for generating magnetic traveling waves respectively connected to one of the phases of a polyphase alternating current and mounted respectively on teeth of said plurality of comb-like magnet cores, said teeth extending in a direction orthogonal to the direction of flow through the tube and having a shape matching the contour of the tube, n.x of said coils of which n equals an optional whole number and X equals the number of a-c phases being mounted on each of said magnet cores, said electromagnetic coils being distributed on at least four said comb-like magnet cores, respectively, disposed in planes extending at an angle other than 90° to said relatively elongated sides of the tube, said planes wherein said magnet cores are disposed being mutually symmetrical with respect to central planes of the tube.

4,449,891

AGGREGATE FOR SUPPLYING FUEL FROM SUPPLY CONTAINER TO INTERNAL COMBUSTION ENGINE

Ulrich Kemmner, Stuttgart, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Mar. 8, 1982, Ser. No. 356,157

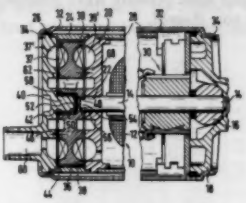
Claims priority, application Fed. Rep. of Germany, Jun. 13, 1981, 3123579

Int. Cl.³ F04D *29/04*

U.S. Cl. 417—423 R 16 Claims

1. An aggregate for supplying a fuel from a supply container to an internal combustion engine, comprising a driven shaft having an axis; means forming a pump chamber and including a wall transverse to said axis of said shaft; an impeller driven by said shaft in said pump chamber; and means for supporting said impeller and having a central recess provided in said impeller, and a bearing projection provided on said wall of said pump chamber and extending into said recess of said impeller.

15. An aggregate as defined in claim 1; and further comprising an electric motor having an armature shaft formed by said driven shaft, at least one further wall forming together with said first-mentioned wall said pump chamber, and a tubular



housing surrounding said electric motor with said walls of said pump chamber.

4,449,892

PUMP WITH ROTARY SONIC PRESSURE WAVE GENERATOR

Arthur P. Bentley, P.O. Box 1952, Roswell, N. Mex. 88201

Continuation-in-part of Ser. No. 396,119, Jul. 7, 1982, which is a continuation-in-part of Ser. No. 254,451, Apr. 15, 1981, Pat. No. 4,381,777, which is a continuation-in-part of Ser. No. 253,317, Apr. 13, 1981, Pat. No. 4,398,870, which is a continuation-in-part of Ser. No. 160,934, Jun. 19, 1980, Pat. No. 4,341,505, which is a continuation-in-part of Ser. No. 958,552, Nov. 8, 1978, Pat. No. 4,259,799. This application Aug. 30, 1982, Ser. No. 412,802

Int. Cl.³ F04F *7/00*

U.S. Cl. 417—240 16 Claims

1. A sonic pressure wave operated pump for pumping liquids and having a column of liquid therein, said pump comprising:

(a) a sonic pressure wave generator having a liquid discharge port and having a rotor and a stator therein;

(b) a metallic production tube coupled to said sonic pressure wave generator and extending therefrom toward the liquid to be pumped;

(c) said rotor and said stator having complimentary elements of a liquid impacting means formed therein for generating sonic pressure waves which move through said production tube along the inner walls thereof toward the liquid to be pumped; and

(d) a pumping unit on the extending end of said production tube and in communication with the liquid to be pumped, said pumping unit having means for receiving the generated sonic pressure waves from said production tube and reflecting them back through the center of said production tube and reacting to the reflection by intaking the

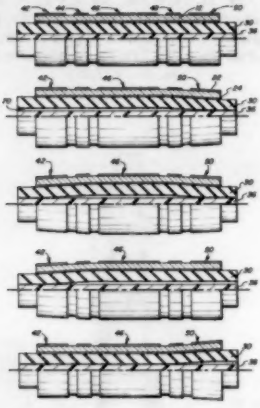
liquid to be pumped to allow the reflected sonic pressure waves to carry the intaken liquid through said production tube and said sonic pressure wave generator to the liquid discharge port thereof.

4,449,893

APPARATUS AND METHOD FOR PIEZOELECTRIC PUMPING

John B. Beckman, Cedartown, and Martin J. Blickstein, Austell, both of Ga., assignors to The Abet Group, Rome, Ga.

Filed May 4, 1982, Ser. No. 374,890
Int. Cl.[3] F04B *43/12, 45/08*
U.S. Cl. 417—322 14 Claims



1. A pump comprising:

a piezoelectric tube having an outer surface and an inner surface defining a cavity;

an inner electrode disposed adjacent said inner surface;

first and second valve electrodes disposed adjacent said outer surface to define first and second valve regions;

a reservoir electrode disposed adjacent said outer surface to define a reservoir region interposed between said first and second valve regions;

a first guard electrode disposed adjacent said outer surface to define a first guard region interposed between said first valve region and said reservoir region;

a second guard electrode disposed adjacent said outer surface to define a second guard region interposed between said second valve region and said reservoir region;

said first and second guard electrodes being electrically connected to said inner electrode to electrically shield said first valve region, said second valve region, and said reservoir region; and

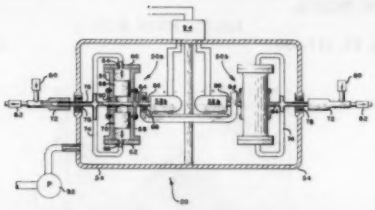
means for apply electrical signals to said outer surface through said first and second valve electrodes, said reservoir electrode and said inner electrode, said electrical signals selectively phased such that said valve and reservoir regions expand and contract to pump a fluid through said cavity.

4,449,894

CENTRIFUGAL-RECIPROCATING COMPRESSOR

Walter H. Higa, Kaneohe, Hi., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Continuation-in-part of Ser. No. 037,194, May 8, 1979. This application Jul. 23, 1982, Ser. No. 401,288
Int. Cl.[3] F04B *17/00, 17/02*
U.S. Cl. 417—328 17 Claims



1. A centrifugal compressor for periodically compressing a charge of fluid comprising:

a cylinder supported for rotation about a fixed axis of rotation which is transverse to the longitudinal axis of the cylinder, said cylinder being supported in fixed relation with said axis of rotation;

means including a vent valve to supply fluid to the cylinder during an intake stroke and including an outlet valve to remove fluid from said cylinder during a compressing stroke;

a free-floating piston head seated in the cylinder and supported for rectilinear displacement along a path normal to said axis of rotation; and

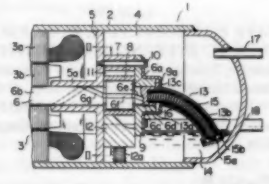
means for reciprocating said piston head within said cylinder including motion producing means for imparting an intake stroke to the head, and for imparting a compression stroke to the head, said motion producing means comprising selectively operable drive means connected in driving relation with the cylinder for imparting angular displacement to the cylinder.

4,449,895

REFRIGERANT COMPRESSOR

Takahisa Kurahayashi, Fujisawa, Japan, assignor to Matsushita Reiki Co., Ltd., Osaka, Japan

Filed Dec. 21, 1981, Ser. No. 333,063
Claims priority, application Japan, Dec. 23, 1980, 55-186118[U]; Mar. 6, 1981, 56-32787; Mar. 6, 1981, 56-32788
Int. Cl.[3] F04B *39/02, 35/04;* F04D *29/28;* F16N *13/20*
U.S. Cl. 417—368 14 Claims



1. A refrigerant compressor comprising:

a closed casing;

a compressor section and an electric motor section adapted for driving the compressor section, said compressor section and said electric motor section are encased by the closed casing; and a crank shaft having a main shaft portion fixed to the rotor of said electric motor section, an eccentric portion for driving said compressor section and an end journal portion, said main shaft portion being

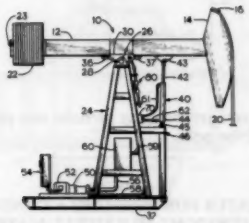
supported by a main bearing while said journal portion is supported by a bearing, said eccentric portion of said crank shaft being provided at its portion of minimum eccentricity with a peripheral oil groove extending substantially parallel to the axis of the crankshaft and which is communicated at its one end with an oil groove formed in the peripheral surface of said main shaft portion and at its other end with an oil groove formed in the peripheral surface of said journal portion.

4,449,896

HYDRAULIC OPERATED SURFACE PUMPING UNIT

Robert Klepper, Arvada, and Daryld W. Bomar, Littleton, both of Colo., assignors to Energy 2000, Inc., Golden, Colo.

Filed Sep. 14, 1981, Ser. No. 302,158
Int. Cl.³ F04B *47/04*
U.S. Cl. 417—399 **29 Claims**



1. In apparatus for producing reciprocal mechanical motion for lifting and lowering a well pump rod string, the improvement comprising:

a double acting hydraulic cylinder and valve means adapted to direct hydraulic fluid under pressure to the rod end of said cylinder while allowing hydraulic fluid to drain from the blind end of the cylinder to tank to produce a phase of the reciprocal motion in one direction, and then alternatively in cycle to direct hydraulic fluid pressure to both the rod end and the blind end of said cylinder simultaneously through a fluid connection common to both said rod and blind ends while prohibiting fluid from either said rod and blind ends of the cylinder to escape to tank to produce a phase of the reciprocal motion in the opposite direction said valve means also including an intermediate position adapted to direct hydraulic fluid pressure to one end of said cylinder while prohibiting escape of hydraulic fluid from the other end of the cylinder as said valve means is in transition during cycling between said phases of reciprocal motion.

4,449,897

SINGLE-ACTING PISTON PUMP HAVING TWO HEADS

William R. Garrett, 24 Palmer Dr., Conroe, Tex. 77302

Filed Sep. 21, 1981, Ser. No. 304,828
Int. Cl.³ F04B *39/00*
U.S. Cl. 417—437 **14 Claims**

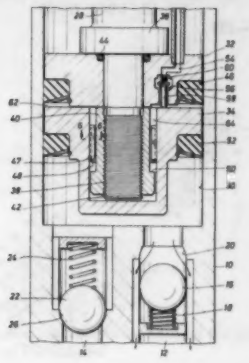
1. A dual seal piston, comprising:

a first piston head for being affixedly secured to a piston rod for operating in a pump chamber and having a forward seal in contact with the wall of said chamber;

a second piston head for being secured to said piston rod and having a foward seal in contact with the wall of said chamber, there being a recess at least partially between said first piston head and said second piston head in communication with a port connectable to a clean and controlled pressure fluid source for providing clean fluid to the foward side of said first piston head and the rearward side of said second piston head;

a controlled pressure fluid source connecting: clean fluid to said port, said controlled fluid source including;

regulating means controlled by contact with said first piston head connected to the downstream side of said



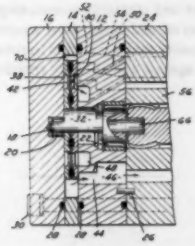
chamber for providing clean fluid from said source to the forward side of said first piston head at a small pressure differential with respect to the pressure in said chamber throughout the forward and rearward strokes of said piston.

4,449,898

POWER TRANSMISSION

Raymond P. Lambeck, Bloomfield Hills, Mich., assignor to Vickers, Incorporated, Troy, Mich.

Filed Jun. 7, 1982, Ser. No. 385,462
Int. Cl.³ F04C *2/10*; F03C *2/00*
U.S. Cl. 418—61 B **5 Claims**



1. In a Gerotor type hydraulic motor or pump wherein a rotary valve selectively provides communications to ports, the improvement wherein said rotary valve comprises

a commutator adapted to be positioned between spaced surfaces and moved in an orbital path with respect to said surfaces,

said commutator comprising spaced members,

means extending between said members such that they are moved in unison,

said members having contacting faces for engaging the respective surfaces, one member engaging one surface and the other engaging the other surface,

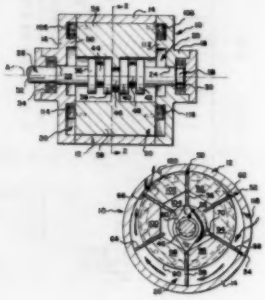
and sealing means between said members yieldingly urging said members against their respective contacting surfaces at all times.

4,449,899

ROTARY VANE MACHINE

Ronald E. Smolinski, Dayton, Ohio, assignor to Ecton Corp., Dayton, Ohio

Filed Apr. 29, 1982, Ser. No. 373,077
Int. Cl.³ F04C *18/00*
U.S. Cl. 418—255 **6 Claims**



1. A rotary vane machine comprising:

a stator housing having an inner surface defining a substantially cylindrical stator chamber having a central stator axis, and having inlet and outlet ports through said housing into said chamber;

a substantially cylindrical rotor mounted within said chamber for rotation about a rotor axis offset from said stator axis;

a crank axle having a crank axis and including a plurality of crank pins offset from said crank axis;

means for rotatably mounting said crank axle within said chamber such that said crank axis is offset from said stator and rotor axes; and

a plurality of vane pairs, each of said vane pairs including two opposing vane members slidably received in said rotor, and means for connecting said opposing vane members together and rotatably connecting said vane pairs to different ones of said crank pins, whereby rotation of said crank axle causes said vane pairs to rotate, said vane members urging against and thereby rotating said rotor.

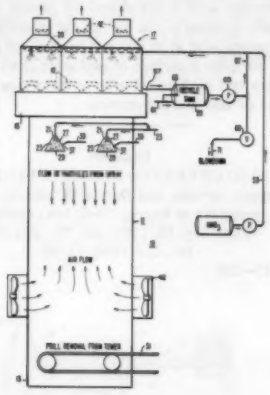
4,449,900

PRILLING

Bernard J. Lerner, 727 Orchard Hill Dr., Pittsburgh, Pa. 15238

Division of Ser. No. 394,297, Jul. 1, 1982, Pat. No. 4,424,072.
This application Aug. 24, 1983, Ser. No. 525,987
Int. Cl.³ B29C *23/00*
U.S. Cl. 425—6 **13 Claims**

11. Apparatus, in whose operation fumes are suppressed, for producing prills including a vertical prilling tower having a prilling head near the top thereof, means, connected to said prilling head, for injecting into said prilling head a melt of the material of which the prills are composed to disperse the melt into a spray which is conducted under gravitational force through the tower, a shroud, means mounting said shroud about the prilling head, means, connected to said shroud for injecting into said shroud a gas which suppresses fumes from the tower, and means for injecting a stream of air into said tower in counterflow relationship to the spray to cool the



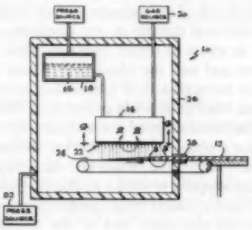
spray and to convert the spray particles into prills and means for collecting the prills.

4,449,901

APPARATUS FOR FORMING A CONTINUOUS LIGHTWEIGHT MULTICELL MATERIAL

Taylor G. Wang, Glendale; Daniel D. Elleman, San Marino, and James M. Kendall, Jr., Pasadena, all of Calif., assignors to California Institute of Technology, Pasadena, Calif.

Filed Jul. 6, 1982, Ser. No. 395,506
Int. Cl.³ B22D *11/01*
U.S. Cl. 425—6 **7 Claims**



1. An apparatus for producing a continuous lightweight multicell material, comprising:

(a) means to form a plurality of hollow gas-filled spherical shells, said means having a plurality of nozzle assemblies, each of said assemblies comprising an outer nozzle for flowing largely vertically downwardly, an annular stream of liquid to be formed into shells, and an inner nozzle for flowing a gas stream within said annular liquid stream to form and fill said hollow spherical shells;

(b) means to supply a heated molten shell-forming liquid to the outer nozzles to form said annular streams and to supply gas streams through the inner nozzles to form said liquid streams into a plurality of gas-filled shells, which harden upon cooling;

(c) receiving means positioned substantially vertically below said nozzle assemblies, to collect said gas-filled shells while said shells are at least partially molten, to permit the coalescence of said shells into a continuously formed multicelled material thereupon, and wherein,

said plurality of nozzle assemblies are arranged in a matrix

pattern of largely horizontal rows and columns, and being positioned a distance above said receiving means to direct and to maintain the relative positions of said formed shells upon said receiving means in substantially the same relative positions said shells assumed upon being formed below said matrix pattern of nozzle assemblies.

4,449,902

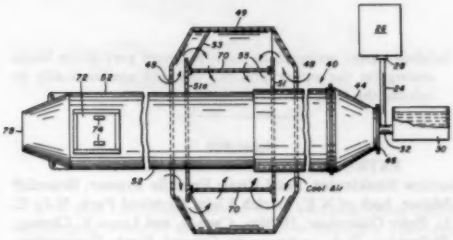
APPARATUS FOR CONTROL OF PARTICLE SIZE IN THE PRODUCTION OF ATOMIZED METAL

Robert A. Ramser, New Kensington, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa.

Filed Nov. 12, 1982, Ser. No. 440,967

Int. Cl.³ B22F *9/00*

U.S. Cl. 425—7 **10 Claims**



1. An apparatus for controlling the size of particles in the production of atomized metal comprising:

(a) a containment vessel comprising a first cylindrical wall, a second cylindrical wall, and an end plate through which atomizing gas and molten metal from a molten metal source enter said vessel through nozzle means sealed thereto;

(b) a restricted air ingress port between said first and second cylindrical walls in said vessel spaced from said end plate, one of said cylinder walls and end plate cooperating with said nozzle means to seal off the interior of said vessel and the metal particles therein from the area adjacent the source of molten metal; and

(c) means for maintaining a predetermined pressure on the molten metal entering said vessel through said nozzle means to control the particle size of the atomized metal produced in said apparatus.

4,449,903

APPARATUS FOR LOADING AND UNLOADING TIRES FOR A TIRE VULCANIZING MACHINE

Akira Hasegawa, and Katsuyoshi Sakaguchi, both of Nagasaki, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

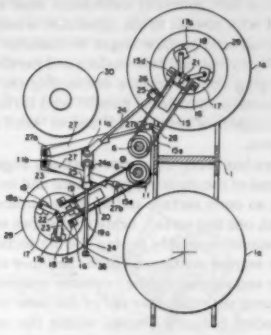
Filed Jul. 14, 1983, Ser. No. 513,667

Claims priority, application Japan, Jul. 14, 1982, 57-122607; Jul. 15, 1982, 57-123301

Int. Cl.³ B29H *5/02*

U.S. Cl. 425—38 **16 Claims**

1. An apparatus for loading or unloading tires for a tire vulcanizing machine, characterized in that said apparatus essentially comprises a pair of vertically extending guide rods fixedly secured to a housing of the tire vulcanizing machine, a common board slidably fitted onto said guide rods so as to be displaced in the vertical direction with the aid of driving means, a pair of booms adapted to be displaced in the vertical direction together with said common board, each of said booms being turnable about the guide rod, tire grasping means including a plurality of grasping pawls disposed at the one end of each of the booms, said grasping pawls being adapted to



expand or contract, and means for limiting the extent of turning movement of the boom.

4,449,904

APPARATUS FOR THE HYDROSTATIC EXTRUSION OF THERMOPLASTIC POLYMERS

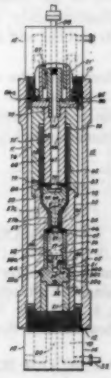
Alfred R. Austen, Center Valley, and Darral V. Humphries, Allentown, both of Pa., assignors to Bethlehem Steel Corporation, Bethlehem, Pa.

Continuation-in-part of Ser. No. 202,282, Oct. 30, 1980, Pat. No. 4,363,611, which is a division of Ser. No. 72,807, Sep. 5, 1979, Pat. No. 4,282,277, which is a continuation-in-part of Ser. No. 941,116, Sep. 8, 1978, abandoned. This application Dec. 13, 1982, Ser. No. 449,289

The portion of the term of this patent subsequent to Dec. 14, 1999, has been disclaimed.

Int. Cl.³ B30B *11/30*

U.S. Cl. 425—97 **7 Claims**



1. Apparatus whereby a thermoplastic polymer preform is hydrostatically extruded while in a solid state into a conduit by compressive pressure, comprising:

(a) outer support means having two ends connected by load supporting members,

(b) a hydraulic pressurizing means axially aligned and contiguous with one end of the outer support means,

(c) a container means including a shell having an outer surface and an inner surface and two end surfaces coaxially aligned within and contiguous with the hydraulic pressurizing means,

(d) a die section formed on the inner surface of the shell at the other end thereof and including a converging first section, a first generally cylindrical land surface axially aligned with respect to the apparatus, a second generally cylindrical land surface larger in diameter than the first generally cylindrical land surface and parallel thereto and a diverging conical surface connecting the first and second generally cylindrical parallel land surfaces and forming an angle α of between 15° and 45° with the axis of the apparatus,

(e) an extrudate receiving means coaxially aligned within the other end of the outer support means and including a shell having an outer surface and an inner surface and two end surfaces, one end surface being contiguous with the end of the container assembly having the die section,

(f) a base section contiguous with the other end of the end surface and supporting the extrudate receiving means and contiguous with the other end of the outer support means,

(g) a mandrel coaxially aligned within the outer shell and having two ends, one end of which is fixedly attached to the base section and the other end supporting a mandrel-head in spaced relation with the surface of the die section, and having a recessed base surface, a generally conical upper portion which forms an angle β of between 20° and 50° with the axis of the apparatus and a generally cylindrical nose portion,

(h) an annular orifice formed by the spaced surfaces of the mandrel-head and the die section comprised of:

(i) a generally converging entrance,

(ii) a generally cylindrical sealing zone,

(iii) a generally conically shaped expanding zone having a generally converging cross-sectional area and a diametrically diverging geometry,

(iv) a generally cylindrical sizing zone parallel to the sealing zone and having a smaller cross-sectional area and a median diameter which is at least 100 percent larger than the median diameter of the sealing zone, and

(v) transition zones of desired radii and smooth surfaces between any two of the zones whereby the billet is substantially simultaneously expanded circumferentially at least 100 percent and axially elongated at least 50 percent, and

(i) sealing means formed by the surfaces of the mandrel-head in contact with the inner surface of the billet and the die surfaces in contact with the outer surface of the billet in the container assembly.

4,449,905

METHOD OF AND ARRANGEMENT FOR MANUFACTURING ENCLOSED BLOCKS

Heinz Züllig, Niederweningen, Switzerland, assignor to Bucher-Guyer AG, Niderweningen, Switzerland

Filed Aug. 6, 1982, Ser. No. 405,874

Claims priority, application Fed. Rep. of Germany, Aug. 26, 1981, 3133663

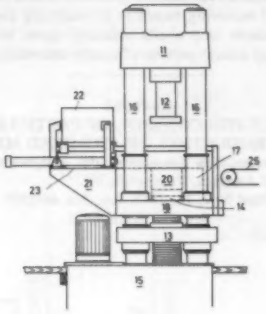
Int. Cl.³ B29C *3/04*; B28B *3/24*

U.S. Cl. 425—117 **9 Claims**

1. Apparatus for manufacturing blocks having a casing assembled from upper and lower parts and filled with a filling material to be pressed in a press having upper and lower pressing dies with an axis and a mold supported on an axially movable mold table and having a mold chamber through which the pressing dies can move, comprising

inserting means movable into a pressing region between upper and lower pressing dies in a direction transverse to the axis of the pressing dies and so arranged that upper and lower parts of a block casing can be inserted into the inserting means,

pushing means provided in said inserting means and arranged to displace the upper and lower casing parts towards the upper and lower pressing dies, and



holding means arranged to hold the upper part of the block casing on the upper pressing die and automatically to release the same during pressing.

4,449,906

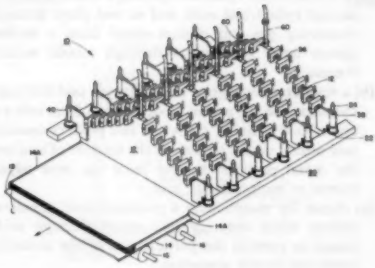
EXTRUSION NOZZLE ARRANGEMENT

Boleslaw Sienkiewicz, Pearl River; Franklin Kramer, Briarcliff Manor, both of N.Y.; Imrich Klein, Highland Park, N.J.; C. G. Peter Oldershaw, Halifax, Canada, and Locus Y. Chuang, Plainsboro, N.J., assignors to General Foods Corporation, White Plains, N.Y.

Filed Jun. 1, 1982, Ser. No. 383,908

Int. Cl.³ B29F *3/04*

U.S. Cl. 425—131.1 **16 Claims**



1. An extrusion nozzle including a bottom orifice for extruding a continuous layer of a generally viscous solution; said nozzle comprising an upright front plate; an upright back plate, means for clampingly engaging said front plate and said back plate so as to form a solution flow space therebetween; solution inlet means in one said plate communicating with the upper end of said solution flow space and with a supply source for said solution, said orifice being a narrow, elongate slot extending along the bottom surfaces of said front and back plates; and insert means in said nozzle located upstream of and being longitudinally coextensive with said orifice in close proximity therewith, said insert means forming predetermined solution flow directing and restricting means protruding into the flow path of said solution so as to impart a predetermined cross-section to the layer being extruded through said orifice, said front plate and back plate each comprising a generally flat plate having upper surfaces sloping from an upper central point towards a wide bottom surface defining said elongate orifice; a recess formed in the inner wall of one said plate extending along approximately the length of said orifice in parallel relationship therewith, said insert means being positioned in said

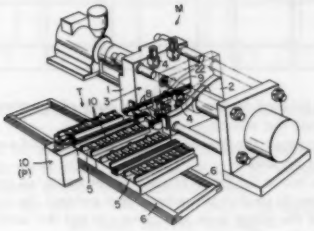
recess and being clamped between said front and back plates, said insert means being removably arranged in said recess so as to be interchangeable with and replaceable by another insert means.

4,449,907

DIES EXCHANGING DEVICE FOR A MACHINE USING DIES

Keitaro Yonezawa, Itamishi, and Tadao Utsumi, Aichiken, both of Japan, assignors to Aioi Seiki Kabushiki Kaisha, Japan

Filed Jul. 11, 1983, Ser. No. 512,663
Claims priority, application Japan, Feb. 4, 1982, 57-14808
Int. Cl.³ B29F *1/00*
U.S. Cl. 425—183 **7 Claims**



1. A dies exchanging device for a machine using dies for exchanging a pair of dies clamped to a stationary plate and a movable plate thereof comprising a first roller transfer means, carriage cars and a push-pull device, wherein:

said first roller transfer means for transferring a pair of dies longitudinally is provided on a stationary plate and a movable plate in the lower part of a die mounting space between said stationary plate and said movable plate;

said carriage cars, at least a pair thereof, are laterally movable in front of said machine and are adapted to be able to stop in front of said die mounting space, and each carriage car is provided with a second roller transfer means of the top thereof;

said push-pull device comprises a main unit independent of said carriage car placed on the floor in front said die mounting space across said carriage car, a drive means on said main unit, a bendable driving band adapted to be driven forward or backward by said drive means between said main unit and said carriage car, a guide means provided on each carriage car for guiding said driving band restraining its bending and a push-pull hook means connected to the forward end of said driving band and is engageable detachably with the mating member of said dies; and

said dies are exchangeable between said die mounting space and either of said carriage cars which is stopped in front of said die mounting space, with said push-pull device and said first roller transfer means and said second roller transfer means, by means of engaging said push-pull hook means with said mating member and guiding said driving band with said guide means.

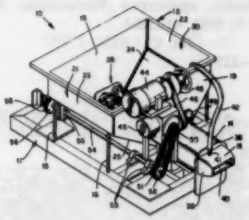
4,449,908

DOUGH PUMP

Sterrett P. Campbell, 3095 Kingston Ct., Norcross, Ga. 30071

Continuation-in-part of Ser. No. 58,120, Jul. 16, 1979, abandoned. This application Apr. 6, 1981, Ser. No. 251,261
Int. Cl.³ A21C *1/06*
U.S. Cl. 425—204 **14 Claims**

1. Apparatus for dispensing dough and the like comprising a dough hopper including converging side walls and opposite end walls, a discharge conduit in communication with the lower portion of said hopper through an end wall, a screw conveyor positioned in the lower portion of said hopper and extending from one end wall to the other end wall and into said discharge conduit, said screw conveyor including a pair of parallel juxtaposed oppositely threaded helical screw elements with the thread of each element projecting into the spaces formed by the thread of the other element and each thread defining an outer periphery, a conveying surface and a following surface, the conveying surfaces of the portions of said screw elements in the lower portion of said hopper extending continuously from said one end wall to said other end wall and being concave and inclined at their peripheries toward said



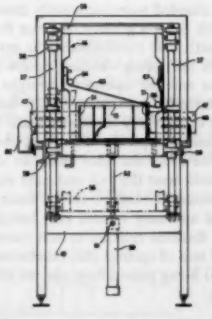
discharge conduit and forming with the outer periphery of its screw element a spiral cutting edge with said spiral cutting edge and said concave conveying surface facing said discharge conduit, and means for venting air from about the helical screw elements, whereby when a mass of dough is placed in the hopper and moves toward the screw conveyor the spiral cutting edges of the screw conveyor slice some of the dough from the bottom of the mass of dough and the concave conveying surfaces of the threads maintain the dough in the confines of the threads and move the dough toward the discharge conduit.

4,449,909

DIE-CUT BRICK MACHINE FOR SPECIAL BRICK SHAPES

Samuel P. Kenworthy, Southern Pines, N.C., assignor to Basic Machinery Co., Inc., Siler City, N.C.

Filed Jul. 23, 1982, Ser. No. 401,102
Int. Cl.³ B29C *17/14*
U.S. Cl. 425—296 **9 Claims**



1. An apparatus for producing special shaped die-cut brick comprising a frame providing a support surface for supporting an elongated green clay slug having a generally rectangular first cross section substantially perpendicular to the length of said slug, a cutting box operable to cut from said slug a core having a second cross section substantially perpendicular to the length of said slug smaller than said first cross section, said core extending lengthwise of a slug resting on said platform, said core having a cross section of the desired brick, power means operable to produce relative movement of said cutting

box and said slug longitudinally with respect to said slug causing said core to be cut lengthwise of said slug, and cutoff means operable to slice laterally through said core along a plane substantially perpendicular to the length of said core and produce a plurality of bricks.

4,449,910

APPARATUS FOR MAKING PROFILED PLASTIC TUBE

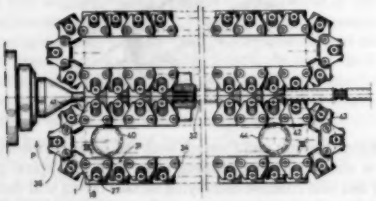
Arnoldus W. J. Leloux, Dedemsvaart, Netherlands, assignor to Wavin B.V., Zwolle, Netherlands

Filed Jun. 8, 1982, Ser. No. 386,280

Claims priority, application Netherlands, Jun. 15, 1981, 8102869; Jul. 8, 1981, 8103254

Int. Cl.³ B29C *17/07*

U.S. Cl. 425—325 **11 Claims**



11. An apparatus for making profiled plastic tube by means of an extruder, said apparatus comprising two opposite circulating chains, each making a plurality of molds or mold halves (18) move along with the tube (2) produced by and coming from the extruder, these molds or mold halves together constituting, in a rectangular portion (32) of the paths (31) of said chains, a mold cavity in which the tube is being given its profile, wherein the molds (18) are arranged movably relative to the chain links (1,2) in a direction perpendicular to the direction of movement (P) of the links, the machine frame being provided with guides (33, 35, 37) for the molds, of which at least a guide (33) in the operative rectilinear portion (32) of the path, is located interiorly with respect to the chain loop and guides (37) in the curved portions (36, 43) of the path are located exteriorly with respect to the loop, said guides (37) for the molds, at the entrance and the exit end, at least at the location of a transition (38,42) to the operative portion (32) of the path, being situated more outwardly than those portions of the guides which lie at a greater distance from said operative portion of the path, said transitions at the entrance and the exit ends of the path (31) being bending points of mathematically calculated paths and the operative straight path tangentially joins said transitional portions (41,42), and braking means comprising sets of auxiliary toothed wheels (54,55) one (54) of which is mounted on a spindle of a driven toothed wheel at the entrance end, the other one (55) being an idle guiding wheel for the drive chain near the exit end, said auxiliary wheel (54) being fixedly mounted relative to the main drive wheel (40) and one of said auxiliary wheels (55) being rotatable over a certain angular distance relative to said main wheel (44), there being provided sets of springs (63) inbetween the two (44, 55) and a chain (56) being passed over the set of auxiliary toothed wheels (54, 55).

4,449,911

LATEX GLOVE METHOD AND APPARATUS FOR MAKING THE SAME

Bernard M. Brasfiel, Arlington, Tex., assignor to Surgikos, Inc., Arlington, Tex.

Division of Ser. No. 129,543, Mar. 12, 1980, Pat. No. 4,371,987. This application Oct. 26, 1981, Ser. No. 314,830

Int. Cl.³ B29H *3/04*

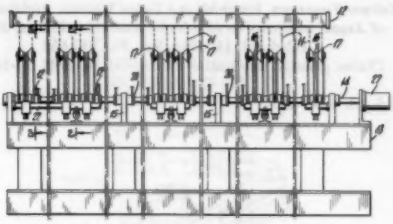
U.S. Cl. 425—374 **4 Claims**

1. Apparatus to form a ring rolled bead on the cuff of an elastomeric glove applied to the surface of a glove form comprising:

a rack containing a plurality of glove forms,

a pair of drive shafts located on opposite sides of the rack containing said glove forms,

a series of arms independently mounted on each of the shafts through free turning bearings,



a wheel located on the free end of each of the arms, means to rotate the wheels,

means to move the free ends of arms toward and away from the forms, and

means to move the forms relative to the center of rotation of the wheels so that the wheels first contact the wrist portion of the glove form and move toward the hand portion of the glove form.

4,449,912

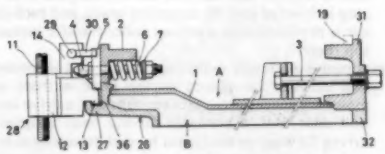
APPARATUS FOR THE AUTOMATIC EJECTION OF CONCRETE PIPES

Mitsuharu Ogura, 1192, Enza-cho, Takamatsu, Kagawa, Japan

Filed Oct. 22, 1982, Ser. No. 435,988

Int. Cl.³ B28B *13/06*

U.S. Cl. 425—444 **3 Claims**



1. An apparatus for manufacturing concrete pipes comprising:

(a) a molding flask, said molding flask comprising a cylindrical body having a bell end and a spigot end, a flange secured to said bell end of said cylindrical body and having an inside annular shoulder and an outside annular shoulder, a plurality of bolts inserted through said flange so as to allow the axes of said bolts to run parallel with the axis of said cylindrical body, a clasp rotatably fitting on each of said bolts in abutment with said outside annular shoulder of said flange, a means for constantly pressing said clasp against said outside annular shoulder of said flange, a first end ring fitting in said flange and held in place by means of said clasps, said first end ring having an outwardly projecting portion which is provided with an annular groove in the surface facing said bolts, and a second end ring fitting in said spigot end of said cylindrical body;

(b) a device for detaching said first end ring from a concrete pipe hardened in said molding flask, said device comprising a means for subjecting said device to reciprocation in the axial direction of said molding flask, a plurality of threaded bolts arranged radially in such a manner that a plane formed thereby is made perpendicular to the axis of said molding flask and that the extension of the axis of said

molding flask passes through the point where the axes of said threaded bolts intersect, a means engaging each of said threaded bolts and adapted for catching said outwardly projecting portion of said first end ring, and a means for giving a kick at said clasp, said means for giving a kick at said clasp being mounted on said means engaging each of said threaded bolts; and

(c) a means for giving an inward push to said second end ring.

4,449,913

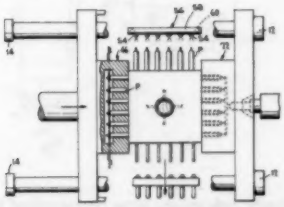
ROTARY INJECTION TURRET FOR THE MAKING OF PREFORMS

Suppayan M. Krishnakumar; Leuan L. Harry, both of Nashua, and Martin H. Beck, Brookline, all of N.H., assignors to The Continental Group, Inc., Stamford, Conn.

Division of Ser. No. 236,960, Feb. 23, 1981. This application Sep. 30, 1982, Ser. No. 429,706

Int. Cl.³ B29D *23/02*

U.S. Cl. 425—548 **11 Claims**



1. A preform injection molding and treating apparatus comprising an injection mold having plural preform cavities arranged in rows and columns, an extruder coupled to said preform mold for simultaneously injecting plastic material into all of said preform cavities, a turret having a plurality of support faces spaced equally about an axis, means mounting said turret for indexing about said axis, each of said support faces having projecting therefrom a plurality of cores equal in number to said preform cavities and arranged in rows and columns with the same spacing as said preform cavities, each of said cores being cooperable with a respective preform cavity to define a preform having a sprue tail, a conditioning mold angularly displaced from said injection mold about said turret, said conditioning mold having a plurality of conditioning cavities equal in number to said preform cavities and arranged in rows and columns with the same spacing as said preform cavities, each of said conditioning cavities being of a greater size than said preform cavities to provide a space around a preform positioned therein for the circulation of a conditioning fluid, sprue tail removal means associated with each conditioning cavity, each conditioning cavity having an exhaust port for the removal of conditioning fluid and a removed sprue tail; means for effecting relative movement between said injection mold, said turret and said conditioning mold to effect the selective opening and closing of said preform cavities and said conditioning cavities; and means for rotating said turret to sequentially present said cores to said preform cavities and then to said conditioning cavities.

4,449,914

INJECTION MOLD WITH DEMOLDING DEVICE

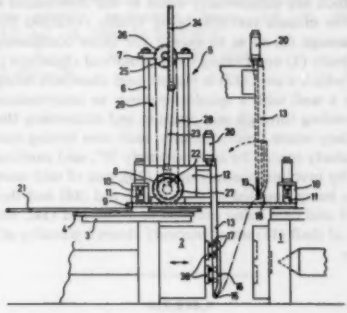
Kurt Schmidts; Walter Schuett, both of Kehl, Fed. Rep. of Germany; Edmond Zeysolff, Meistratzheim, France, and Wilhelm Saumer, Emmendingen, Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Dec. 23, 1982, Ser. No. 452,423

Claims priority, application Fed. Rep. of Germany, Jan. 7, 1982, 8200184[U]

Int. Cl.³ B29F *1/14*

U.S. Cl. 425—556 **4 Claims**



1. An injection mold comprising a fixed and a movable mold half and a demolding device for the moldings which is connected to the movable mold half and which consists of one or more grippers guided in a pair of rails by means of a holder plate, a mounting plate for the pair of rails, a pinion which is rotatably held on the mounting plate and can roll on a rack which can be firmly connected to the fixed mold half or to the mounting plate, and a kinematic chain which converts the rotary movement of the pinion into a rectilinear movement of the holder plate for the grippers, wherein, in order to form the kinematic chain, the pinion is connected to a crank and the latter in turn is connected, via a hinged connecting rod, with an oscillating crank constructed as a rack for driving a further pinion, and the shaft of this pinion is coupled to a chain drive, to whose transport chain is fixed the holder plate for the grippers.

4,449,915

CLOSURE SYSTEM FOR LIQUID INJECTION APPARATUSES

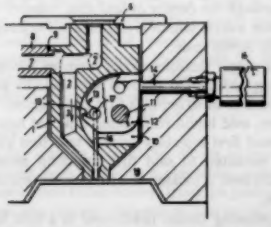
Anthonie van den Brink, Westmaas, Netherlands, assignor to Eurotool B.V., Westmaas, Netherlands

Filed Feb. 18, 1982, Ser. No. 349,731

Claims priority, application Netherlands, Feb. 18, 1981, 8100791

Int. Cl.³ B29F *1/03*

U.S. Cl. 425—564 **12 Claims**



1. A closure system for use in liquid injection apparatuses for

interrupting the injection of liquids into cavities, in particular liquids under a relatively high pressure and/or at relatively high temperatures, like plastics which are injected into injection moulds via a liquid passage, defined by a central body (1), said closure system having a closure rod which can be retractably placed in a gating of the liquid passage, said liquid passage (2) extending in a bended manner, the closure rod (16) extending through a wall of the central body (1), said gating being located at a bend in said liquid passage, said bend being situated above cross-sectional termination of said liquid passage in said central body, said closure rod having cross-sectional dimensions which are substantially equal to the dimensions of said gating, the closure rod (16) being totally retracted from the liquid passage (2) so as to expose the latter completely, said central body (1) comprising two cylindrical chambers (10), in each of which a cam (12) is placed, said chambers being separated by a wall with a spindle opening, an intermediate shaft (11) extending through said opening and connecting the cams so that they rotate simultaneously, each cam having two cavities angularly spaced by approximately 90°, said cavities being defined by involute pressure areas (13), one of said cavities of said cam being coupled to the closure rod (16) and the other cavity of said cam being coupled to a pull rod (14), whereby rotation of shaft (11) simultaneously closes a plurality of liquid passages.

4,449,916

DEVICE FOR MANUFACTURING INFORMATION RECORDING MEDIUMS

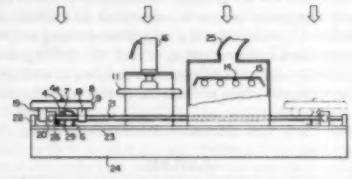
Keisuke Ito, Kashiwara; Toshiaki Kashihara, Hirakata, and Yoshihiro Okino, Uji, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Nov. 16, 1981, Ser. No. 321,562

Claims priority, application Japan, Nov. 20, 1980, 55-163893; Apr. 1, 1981, 56-49862

Int. Cl.³ B28B *17/00*

U.S. Cl. 425—174.4 **7 Claims**



1. A device for manufacturing an information recording medium made from a radiation curable layer-forming liquid resin, comprising:

(a) a first movable base;

(b) a first planar stamper carrying an information recording signal pattern to be transcribed, said first planar stamper being mounted on said first movable base;

(c) first injecting means mounted in the center part of said first movable base, retractably projecting upward from and through the center of said first stamper and having an injection nozzle which is closed after injection, for injecting said liquid resin;

(d) a first planar flexible carrier member having at least one carrying surface and adapted to be held by said first injecting means so as to define a first gap together with said first stamper, said liquid resin being injected into said first gap from said first injecting means, said first carrier member being mounted to said first injecting means when said movable base is located in a first carrier member mounting section;

(e) first pressing means positioned in a first liquid resin injecting and pressing section, for pressing a hold member against said first carrier member so as to uniformly distribute the liquid resin injected from said first injecting means all over the surface of said first carrier member;

(f) first irradiating means positioned in a first radiant ray irradiating section, for irradiating radiant rays to said liquid resin in said first gap so as to form at least a portion of an information recording medium;

(g) first separating means positioned in a first carrier member separating section, for separating said first carrier member so as to remove and obtain said at least a portion of said information recording medium; and

(h) first shifting means for shifting said first movable base together with said first stamper and first carrier member from said first carrier member mounting section, sequentially through said first liquid resin injecting and pressing section and said first radiant ray irradiating section, to said first carrier member separating section, and then returning the same to said first carrier member mounting section.

4,449,917

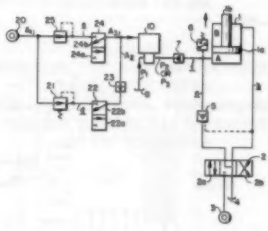
HYDRAULIC VULCANIZING PRESS

Akira Hasegawa, and Yoshinori Miyamoto, both of Nagasaki, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 24, 1983, Ser. No. 508,006

Int. Cl.³ B30B *15/22, 15/00*

U.S. Cl. 425—149 **4 Claims**



1. A hydraulic vulcanizing press characterized in that there are provided a pneumatic booster for supplying a hydraulic pressure to a hydraulic circuit on a pressurizing actuation side of a pressing hydraulic cylinder in said hydraulic vulcanizing press in order to pressurize and hold the pressure in the pressing hydraulic cylinder, and a switching device for switching a pressurized air fed to said pneumatic booster between a high pressure air for boosting a hydraulic pressure to a desired hydraulic pressure and a low pressure air for holding said desired hydraulic pressure after said desired hydraulic pressure has been attained.

4,449,918

APPARATUS FOR REGULATING FURNACE COMBUSTION

Richard F. Spahr, Ambler, Pa., assignor to Selas Corporation of America, Dresher, Pa.

Filed Jul. 6, 1981, Ser. No. 280,994

Int. Cl.³ F23N *5/00*

U.S. Cl. 431—76 **2 Claims**

1. Apparatus for regulating flow of combustion air to a furnace thereby to maintain a relatively optimum fuel-air mixture for high combustion efficiency in response to a measured level of carbon dioxide in furnace gas after combustion thereof, comprising:

a. gas analyzer for sensing relative level of carbon dioxide in furnace gas after combustion thereof and producing an electrical signal proportional to sensed carbon dioxide level;

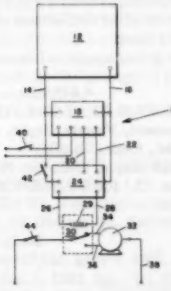
b. amplifier means, receiving said electrical signal from said

gas analyzer, for boosting said signal to a second signal level;

c. a first loop circuit having said second signal applied to respective terminals thereof, said first loop circuit including:
   i. an inductor defining an input coil of a relay;
   ii. a capacitor;
   iii. variable resistance means in series connection with said capacitor for tuning the resultant resistor-capacitor combination;
   iv. first switching means, in series with said capacitor-variable resistor combination, for open circuiting said resistor-capacitor combination with respect to said inductor; and
   v. second switching means, in parallel with said first switching means-resistor-capacitor combination, for short circuiting said first switching means-resistor-capacitor combination;

d. said relay having its output connected in series with a second loop circuit;

e. said second loop circuit including;
   i. a meter for visibly indicating current flow around said circuit;
   ii. an input coil to a second relay;
   iii. an output winding of a transformer;
   iv. rectifier means for rectifying said transformer output; and



   v. third switching means for opening said second loop circuit;

f. said transformer having its input winding connected to line voltage;

g. second relay output being movable between respective input terminals of an electric motor for selective connection thereof with line voltage;

h. said electric motor having an output shaft rotating in respective opposite directions according to which of said respective input terminals is contacted by said second relay output;

i. a damper, controlling flow of combustion air to said furnace, connected to said electric motor output shaft, opening further and closing further upon rotation of said motor shaft in respective opposite directions;

j. fourth switching means for open circuiting said electric motor; and

k. a timer operatively connected to said fourth switching means, for sequentially
   i. opening said second and fourth switching means while maintaining said first and third switching means closed;
   ii. opening said first and third switching means while maintaining said second and fourth switching means closed;
   iii. closing said second, third and fourth switching means while maintaining said first switching means open;
   iv. opening said second, third and fourth switching means while maintaining said first switching means closed; and
   v. closing said first and third switching means while maintaining said second and fourth switching means open.

4,449,919

GAS COMBUSTION APPARATUS CAPABLE OF DETECTING ENVIRONMENTAL OXYGEN DEFICIENCY

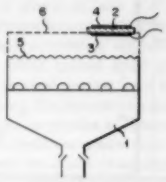
Osamu Takikawa, Chigasaki; Masaki Katsura, Yokosuka; Chiaki Tanuma, Tokyo, and Katsunori Yokoyama, Ebina, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

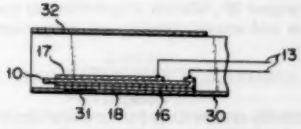
Filed Jun. 2, 1981, Ser. No. 269,757

Claims priority, application Japan, Jul. 10, 1980, 55-96210[U]; Jul. 10, 1980, 55-96211[U]

Int. Cl.³ F23H *5/24*

U.S. Cl. 431—76 **5 Claims**





1. A gas combustion apparatus including at least one burner for producing a flame, said apparatus including a flat oxygen sensor for producing a control signal for control of the combustion apparatus, said flat oxygen sensor being arranged to be exposed to said flame of only one said at least one burner, said sensor having electrodes on both a measuring side and a reference side thereof and which is capable of detecting oxygen deficiency of combustion exhaust gas wherein said flat oxygen sensor is prefixed in a position relative to said burner such that, under a normal combustion condition, said electrodes at both the measuring side and the reference side are in the combustion exhaust gas and, under an oxygen deficiency condition wherein said flame is elongated in size by the incomplete combustion said flame is in contact only with said measuring side electrode, and wherein said oxygen sensor is mounted to a holder of a heat-resistant metal having an opening such that the position of at least part of said measuring side electrode corresponds with said opening.

4,449,920

DEVICE FOR IGNITING A TORCH

André Lerouge, Argent sur Sauldre; Jean-Louis Andre, Vitry, and Pierre Coutin, Paris, all of France, assignors to R. Alkan & Cie, Valenton and Elf France, Paris, both of, France

Filed Jun. 30, 1982, Ser. No. 393,797

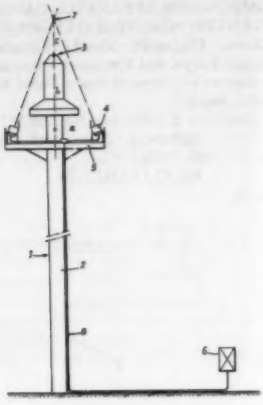
Claims priority, application France, Jul. 3, 1981, 81 13170

Int. Cl.³ F41H *9/02*

U.S. Cl. 431—91 **7 Claims**

1. A device for igniting a torch by means of pyrotechnical cartridges, wherein each cartridge is placed in a casing located at a first distance of one to ten meters from the geometrical axis of the torch and at a second distance of two to twenty meters below the orifice of said torch, said casing being provided with a cover adapted to be moved from a closed position wherein the cartridges within the casing are contained in a thermally

isolated tight compartment to an open position wherein each cartridge is aimed at a selected point located on the torch axis at a third distance of one to ten meters above the torch orifice, said second distance being greater than said third distance, and



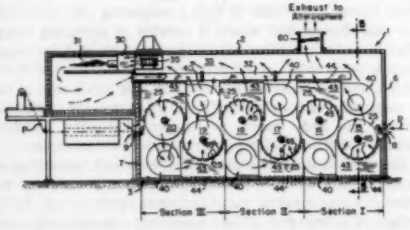
said first, second and third distances being selected in such a manner that a/(b+c) has a value comprised between tangent 45° and tangent 20°, wherein a represents said first distance, b represents said second distance, and c represents said third distance.

4,449,921

COMBINED OVEN AND FUME INCINERATOR AND METHOD OF OPERATING SAME

Frank Catallo, 84 Wheatley Rd., Old Westbury, N.Y. 11568

Filed Sep. 2, 1982, Ser. No. 414,397
Int. Cl.³ F27B *9/28*
U.S. Cl. 432—8 **10 Claims**



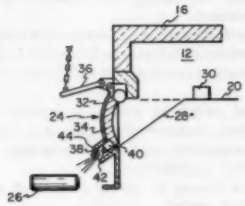
10. A method of operating a combined oven and fume incinerator to treat a product having an enclosed housing, a combustion chamber forming a fume incinerator and a source of heat for said oven, a plurality of process zones in said housing, a cool air inlet passage extending from said process zones to said combustion chamber, a hot air duct extending from said combustion chamber to said process zones, a blower means for circulating air in said housing through said combustion chamber into said hot air duct to said process zones and from said process zones to said air inlet passage and from said air inlet passage into said combustion chamber, and an exhaust fan for exhausting a portion of the air from said cool air inlet passage; comprising the steps of simultaneously exhausting a portion of the air circulating in said cool air inlet which is least contaminated with fume to a point exterior of the housing and recycling the remaining air in said cool air inlet passage through said combustion chamber.

4,449,922

REHEAT FURNACE DROP OUT DOOR SEAL

Harry P. Finke, Pittsburgh, Pa., assignor to Bloom Engineering Company, Inc., Pittsburgh, Pa.

Filed Aug. 30, 1982, Ser. No. 412,777
Int. Cl.³ F24F *9/00*; F23M *11/02*; F27D *1/18*
U.S. Cl. 432—64 **7 Claims**



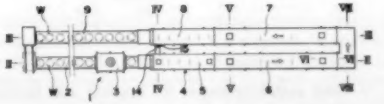
1. In a reheat furnace having a furnace exit door, a drop out slope extending from a hearth line inward of the door and internal of the furnace extending to a passline external of said door and furnace, the improvement comprising fluid curtain means connected to the door at substantially a bottom end thereof and exiting at an elevation below the hearth line and directed along the drop out slope and away from the furnace to prevent air from entering the furnace along the drop out slope in the area of the door.

4,449,923

CONTINUOUS HEAT-TREATING FURNACE

Yoshikazu Shimosato, Yawata, Japan, assignor to Chugai Ro Kogyo Co., Ltd., Osaka, Japan

Filed May 4, 1982, Ser. No. 374,903
Int. Cl.³ F27D *15/02*; F28D *13/00*
U.S. Cl. 432—82 **18 Claims**



1. A continous heat-treating furnace comprising:

a housing structure having an entrance and an exit defined at its opposite ends, respectively, and also having defined therein a preheating zone adjacent the entrance, a cooling zone adjacent the exit and a high temperature zone intermediate between the preheating and cooling zones, a recirculating duct providing a fluid connection with a portion of the housing structure approximately adjacent the entrance of the preheating zone to another portion of the housing structure approximatedly adjacent the exit of the cooling zone, and

means for forcibly drawing gas from the preheating zone and introducing it into the cooling zone through the recirculating duct.

4,449,924

INDUSTRIAL FURNACE

Claudia Ceretti, Via Ida Braggio n. 1, Domodossola, Italy

Filed Apr. 7, 1982, Ser. No. 366,210
Claims priority, application Italy, Apr. 14, 1981, 67513 A/81
Int. Cl.³ F27B *9/16*; B66C *17/08*; F23K *3/00*
U.S. Cl. 432—138 **12 Claims**

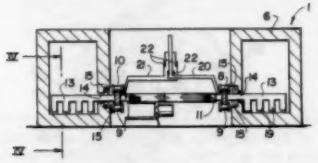
1. An industrial furnace for heating particulate material, comprising:

a plurality of refractory walls defining a chamber having a floor;

heating means associated with said chamber for heating contents of said chamber;

at least one of said refractory walls including an inlet orifice communicating with said chamber for receiving particulate material into said chamber and a discharge orifice communicating with said chamber for discharging particulate material from said chamber;

at least one arm movable in said chamber in a substantially horizontal plane and over said floor for pushing particulate material toward said discharge orifice; and



drive means connected to said arm for moving said arm in said chamber;

said arm including a plurality of spaced apart downwardly projecting teeth for stirring and moving particulate material on said floor of said chamber, said arm including a first passageway defined therein for the circulation of a coolant for cooling said arm with said teeth and a second passageway defined therein and communicating with said chamber through said teeth for the passage of particulate material into said chamber.

4,449,925

HEATING DEVICE AND METHOD OF HEATING ARTICLES

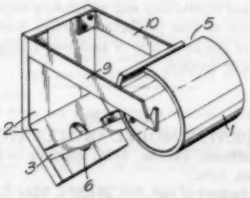
Alan E. Williams, 9 Willes Rd., Leamington Spa, Warwickshire, and Andrew R. Gibbs, 19, Bishops Rd., Sutton Coldfield, West Midlands, both of England

Continuation of Ser. No. 147,066, May 6, 1980, abandoned. This application Mar. 1, 1982, Ser. No. 353,366

Claims priority, application United Kingdom, May 12, 1979, 7916545; Feb. 2, 1980, 8003582

Int. Cl.³ F24J 3/00

U.S. Cl. 432—225 **2 Claims**



1. A device suitable for heating an article with a gas heating tool, which integrally comprises:

(a) an element in the form of a hollow, substantially tubular right circular cylinder that is open at each end and that is arranged to be heated by a flame from the tool and to radiate thermal energy onto at least a major part of the surface of the article;

(b) means for receiving the gas heating tool oriented so that a flame from the tool heats the element,

(c) locating means for locating the article in a position spaced apart from the element where at least part of the element is curved around the position in which the article is located, said locating means preventing the article from touching the element, in which spaced apart position the article receives radiant thermal energy from the element, and

(d) means for retaining the element in a position between the article and the tool to receive at least a major portion of the flame and to shield the article from the flame,

wherein the element has a slot extending from one end to the other to allow the article to be located within the element.

2. A tool for heating an article which integrally comprises:

(a) means for holding a gas burner,

(b) an element in the form of a hollow substantially tubular right circular cylinder that is open at each end and that is arranged to be heated by a flame from the burner and to radiate thermal energy onto at least a major part of the surface of the article,

(c) means for locating the article in a position spaced apart from the element where at least part of the element is curved around the position in which the article is located, said locating means preventing the article from touching the element, in which spaced apart position the article receives radiant thermal energy from the element, and

(d) means for retaining the element in a position between the article and the tool to receive at least a major portion of the flame and to shield the article from the flame,

wherein the element has a slot extending axially from one end to the other to allow the article to be located within the element.

4,449,926

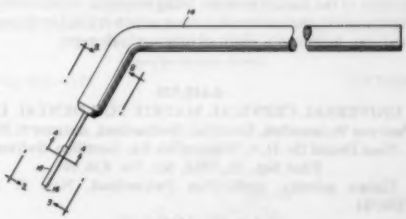
DENTAL ELECTROSURGERY ELECTRODES AND METHOD OF USE

Peter A. Weiss, 501 Greendale Ave., Needham, Mass. 02192

Continuation of Ser. No. 183,035, Sep. 2, 1980, abandoned. This application Nov. 23, 1981, Ser. No. 323,804

Int. Cl.³ A61C 3/00

U.S. Cl. 433—32 **9 Claims**



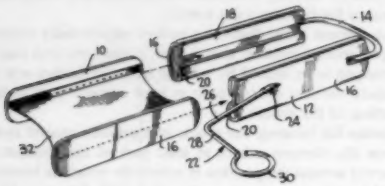
1. An electrosurgery tip for dental use for forming a uniform thin groove in the gum groove that is naturally defined about a tooth to receive the margin of crowns or inlays and comprising a metallic tip having on a limited portion of its radiating surfaces an electrical insulation material for providing a non-incinerating contact between the tip and tooth, whereby when the electrosurgery tip is placed in the gum groove the insulation material is in contact with the associated tooth, whereby the incinerating surface or surfaces of the tip can be guided by contact of the non-incinerating surface with and relative to said tooth in a desired path of incineration without causing incineration of said tooth, said incinerating surface or surfaces presenting a radiating surface to the lateral wall of the gum groove to form the uniform thin groove about the periphery of the tooth meant to receive the margin of the crown or inlay, said tip being of about one-quarter millimeter thickness to thus form the uniform thin groove of like width, said radiating and insulating surfaces of the tip being substantially oppositely faced.

4,449,927

DENTAL BITE RELATOR

James C. Taylor, P.O. Box 1019, and Leonard B. Barber, Jr., 820 Fleming St., both of Hendersonville, N.C. 28793

Filed Mar. 8, 1982, Ser. No. 355,383
Int. Cl.³ A61C 9/00
U.S. Cl. 433—38 1 Claim



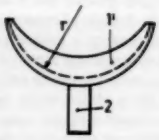
1. A dental instrument for simultaneously taking an impression of prepared teeth and the bite registration thereof with respect to the arch quadrants opposing said prepared teeth comprising a pair of parallel laterally spaced apart, oppositely disposed elongated bite tray holders adapted to hold and support a bite tray therebetween, each of said bite tray holders having inner elongate faces provided with a longitudinally extending channel, said channels being open at each end and disposed in facing relation to receive a portion of a bite tray, an arcuate wire member fixed to and extending between complementary ends of the bite tray holders outwardly thereof for maintaining them in spaced apart, oppositely and complementarily disposed relation, said tray holders having outer faces and a one-piece handle member angularly projecting from and fixed to the outer face of one tray holder adjacent its end opposite the end connected to the other tray holder, said handle member having an inner end portion fixed to and projecting forwardly and only slightly angularly outwardly from its associated tray holder and having an outer end portion disposed at an acute angle to the inner end portion said handle member being a one-piece rod-like element with the outer end portion of the handle member being disposed substantially at a right angle to the inner end portion which is fixed to the associated tray holder at a slight obtuse angle thereto.

4,449,928

UNIVERSAL CERVICAL MATRIX FOR DENTAL USE

Beat von Weissenfluh, Gentilino, Switzerland, assignor to Hawe-Neos Dental Dr. H. v. Weissenfluh SA, Gentilino, Switzerland

Filed Sep. 28, 1982, Ser. No. 426,184
Claims priority, application Switzerland, Nov. 9, 1981, 7334/81
Int. Cl.³ A61C 9/00
U.S. Cl. 433—40 5 Claims



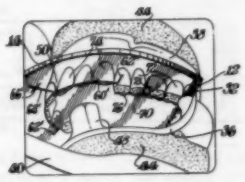
1. A universal cervical matrix for dental use transparent to ultraviolet rays and to rays of the visible spectrum to permit rapid hardening by polymerization of the filling material and of a material which does not adhere to that of the said filling, characterized by a concave elastic lamina (1) with radius of curvature (r) less than that of the various teeth to which it may be applied and tapered to thin edges (1') to be able to penetrate under the gum, the lamina being provided at the rear with a stem (2) adapted to be grasped with forceps so as to press it strongly against the tooth to be treated so that by thus increasing its radius of curvature it can be adapted perfectly to the shape of the tooth to which it is applied.

4,449,929

DENTURE ALIGNMENT KIT

Russell I. Reese, Ontario, Calif., assignor to Pfizer Inc., New York, N.Y.

Continuation of Ser. No. 230,071, Jan. 30, 1981, abandoned. This application Aug. 11, 1982, Ser. No. 407,210
Int. Cl.³ A61C 11/00
U.S. Cl. 433—56 1 Claim



1. A method of facilitating the accurate positioning of artificial teeth during the setup stage in the fabrication of full dentures, which comprises the steps of

contacting a lower record base with an occlusal guide comprising a rigid transparent sheet with a rear edge, said contact being between said rear edge and the retromolar pads of said base, while said guide is positioned in the contemplated occlusal plane of said dentures,

contacting a cusp ridge locator comprising a rigid wedge-shaped sheet having adjacent first and second edges meeting at an acute angle at said first edge with the ridge crest of said lower record base, said locator being wedged between said guide and said lower record base in a position substantially normal to said guide with said second edge of said locator resting against the lower surface of said guide, and

visually projecting the contact point of said first edge with said ridge crest onto said guide with the aid of one of a series of parallel lines inscribed on a surface of said locator normal to said second edge and extending from said second to said first edge, and marking said projection on the upper surface thereof,

repeating said contacting and projecting steps to establish a progression of said projected contact points constituting transfer of the crest line of said lower ridge crest to said upper guide surface.

4,449,930

DENTAL MODEL ARTICULATOR

Ronald E. Huffman, Tucson, Ariz., assignor to KV33 Corporation, Tucson, Ariz.

Continuation-in-part of Ser. No. 261,562, May 7, 1981, Pat. No. 4,382,787. This application Apr. 20, 1983, Ser. No. 486,897
Int. Cl.³ A61C 11/00
U.S. Cl. 433—64 35 Claims

11. An articulator for correlating the casts of a dental model, each of the casts including a mounting, said articulator comprising in combination:

(a) pair of resiliently flexible brackets, each said bracket terminating at one end;

(b) means for pivoting the one end of one bracket with the one end of the other bracket about a common pivot axis; and

(c) means for interconnecting each of the casts with another end of one bracket of said pair of brackets, said interconnecting means including a ball and socket joint wherein one of the ball and socket of said ball and socket joint is

defined by the mounting and wherein the other of the ball and socket of said ball and socket joint is formed by said bracket;

whereby, the angular relationship between each cast and the interconnected one of said pair of brackets may be fixed after

registration of the casts relative to one another by adjusting the angular relationship between each mounting and its engaged one of said pair of brackets and by adjusting the angular relationship about the pivot axis between the pivotally connected ends of said pair of brackets.

4,449,931

TOOL FOR MAKING SEPARATED TOOTH MODEL

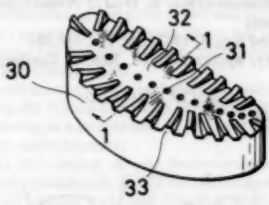
Koji Saito, Shiga, Japan, assignor to Kyoto Ceramic Co., Ltd., Japan

Filed Mar. 10, 1982, Ser. No. 356,828

Claims priority, application Japan, Mar. 17, 1981, 56-37937[U]; Dec. 28, 1981, 56-212275

Int. Cl.³ A61C *19/00*

U.S. Cl. 433—74 **7 Claims**



1. A tool for making separated tooth models comprising:

a tray having a plurality of holes made vertically in the surface of said tray, the tray having a sunken portion in the surface thereof gradually deepening from the circumference of said tray to the central portion of the surface of said tray, and

a plurality of pins, each of said pins having a leg portion and a head portion, wherein said leg portion is removably engaged with said holes and said head portion is positioned above the surface of said tray.

4,449,932

CONTRA-ANGLE HEAD FOR DENTISTRY

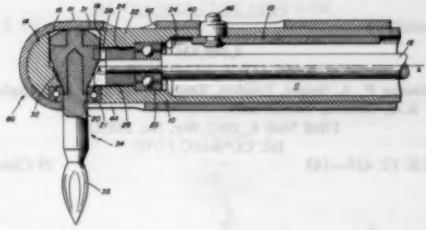
Leopold P. Lustig, 304 Greenwood St., Newton Center, Mass. 02159

Filed Jun. 17, 1982, Ser. No. 389,408

Int. Cl.³ A61C *1/08, 1/12*

U.S. Cl. 433—126 **7 Claims**

1. A contra-angle head for a dental handpiece comprising a rigid tubular housing member elongated on its axis to provide an alley open at a first end for receiving a drive shaft and having at the second end a chamber with an access opening though a side of said housing member for receiving in said chamber a dental tool for rotation on a tool axis that is transverse to said housing member axis, said chamber having a tool shaft opening through a diametrically-opposite side of said housing member from said access opening for passing a dental tool shaft, means in said tool shaft opening to support said dental tool shaft, when present, for rotation around said tool axis, a latch member in the form of a thin-walled tubular shell slidingly enclosing a portion of said housing member including said second end and being movable relative to said housing member, said latch member having a first latch aperture which is large enough to allow a tool to pass through said first access opening from outside said shell and a second elongated latch aperture the width of which is approximately the same as the



diameter of said tool shaft opening, said latch apertures being located diametrically opposite each other in said shell, means for locating said latch member on said housing member and operative to put said latch member alternatively in a first location on said housing member in which said first latch aperture is in register with said access opening and in a second location on said housing member in which a cover portion of said shell overlies said access opening, said second latch aperture being long enough and so oriented as to leave said tool shaft opening uncovered when said latch member is in each of said locations and at all positions between them.

4,449,933

INTERPROXIMAL DENTAL STIMULATOR AND CLEANING APPARATUS

William J. Forni, 2911 Montecito Ave., Santa Rosa, Calif. 95404

Filed Feb. 1, 1982, Ser. No. 344,312

Int. Cl.³ A61L *3/00*

U.S. Cl. 433—141 **33 Claims**

1. An interproximal dental stimulator and cleaning apparatus of the type which is manipulated by handle means, for use in the dental sulcus region between a tooth and adjacent interproximal gingival papilla, comprising:

a first flexible member, having a broad end, a tip, and a longitudinal axis which extends from the broad end to the tip, the broad end of the member being attached to the handle means,

the member including, first and second elongated, wing-like structures which extend along, and project a predetermined outward distance from, the longitudinal axis, the outward distance being largest at the broad end of the member and decreasing in magnitude toward the

tip, so that the member has a generally arrowhead-like shape,

wherein each wing-like structure comprises a plurality of fingers which provide cleaning and stimulating surfaces, and

furtherwherein the member is shaped so that it can be inserted between adjacent teeth so that the interproximal gingival papilla between the teeth is accepted between the first and second wing-like structures, and so that the structures occupy and can be manipulated within the dental sulcus regions between the papilla and teeth.

4,449,934

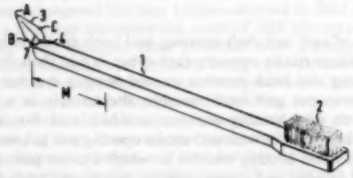
PLAQUE REMOVER

Hassan P. A. Salam, London, England, assignor to Unisplay, S.A., Geneva, Switzerland

Filed Nov. 4, 1981, Ser. No. 318,237

Int. Cl.³ A61C *17/00*

U.S. Cl. 433—143 **29 Claims**



1. An instrument for removing plaque from natural teeth, comprising:

a member arranged to replaceably fit onto a handle;

a blade of thin flexible sheet-like material tapering in width from a base portion to an apex, said blade being stiffened by having a fold forming a valley extending along the direction from said base portion to said apex;

means securing said blade to said member arranged so that said blade extends away from said member and arranged to maintain said fold at said base portion;

the combination of said blade and said member being compact in the direction in which said blade extends away from said member facilitating placement of said combination in the mouth for scraping the back surfaces of the front teeth and each side surface of each of the other teeth, said blade and said securing means being arranged to resist buckling when said blade is subjected to forces in the direction onto its concave side normal to its surface arising from said scraping.

4,449,935

TOOTH CROWN REMOVER

William H. Harris, Oklahoma City, Okla., assignor to Hampton Research & Engineering, Inc., Oklahoma City, Okla.

Filed Feb. 22, 1983, Ser. No. 468,814

Int. Cl.³ A61C *3/08*

U.S. Cl. 433—151 **2 Claims**

1. A tooth crown remover, comprising:

an elongated handle having an end surface forming an anvil;

a mandrel coaxially secured to the anvil end of said handle, the end portion of said mandrel opposite the handle coaxially converges away from the handle and terminates in an annular shoulder facing the handle normal to the mandrel axis;

a sleeve-like hammer longitudinally slidably surrounding the end portion of said mandrel adjacent said handle; and,

spring means interposed between said hammer and said mandrel for biasing said hammer toward said handle,

the end portion of said mandrel adjacent said handle being diametrically reduced to form an annular space for nesting said spring means.

4,449,936

PROCESS FOR THE PREPARATION OF DENTURES

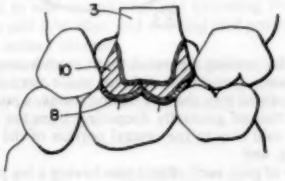
Peter Bayer, Nassauerstrasse 6, D-6272 Niedernhausen, Fed. Rep. of Germany

Filed Sep. 8, 1982, Ser. No. 415,933

Claims priority, application Fed. Rep. of Germany, Sep. 8, 1981, 3135469

Int. Cl.³ A61C *9/00*

U.S. Cl. 433—214 **8 Claims**



1. A process for preparing a workpiece for use as denture parts or denture models comprising the steps of:

(a) arranging a working model to which the workpiece is to be secured and a counter bite model in an articulator;

(b) arranging a mold between opposing surfaces of said models in the area between said working model and counter bite model;

(c) filling said mold with a hardenable material;

(d) bringing together said working model and counter bite model in said articulator so that parallel planes which include the opposing surfaces of said models are spaced apart by a distance d, said distance corresponding to the wall thickness of said mold in the direction normal to said planes;

(e) allowing said hardenable material to solidify; and

(f) removing said mold, whereby a hardened workpiece is formed.

4,449,937

DENTAL ANCHOR

Bernard Weissman, New York, N.Y., assignor to Ipco Corporation, White Plains, N.Y.

Filed Dec. 3, 1981, Ser. No. 326,851
Int. Cl.³ A61C 5/08
U.S. Cl. 433—225 13 Claims

1. A dental anchor for securing a superstructure to a tooth understructure, comprising:

an elongated anchoring portion having a specific length for insertion within a channel extending into the tooth understructure, the channel having a predetermined length greater than said specific length of said anchoring portion;

said anchoring portion including a threaded section;

a coaxial, elongated retaining portion having a non-circular cross section for embedding within the superstructure;

depth-limiting means integrally disposed between said anchoring portion and said retaining portion for limiting depth of insertion of said anchoring portion into the channel so that said anchoring portion is spaced from a bottom of the channel;

a manipulating end portion for facilitating insertion of said anchoring portion into the channel;

a frangible reduced thickness portion interposed between said manipulating end portion and said retaining portion to permit severing of said manipulating end portion from said retaining portion after said anchoring portion is inserted into said channel; and

said depth-limiting means including a frustro-conical section outwardly flaring from said elongated anchoring portion for seating in a countersink at an upper end of the channel in the understructure;

whereby the seating of said frustro-conical section in the channel countersink causes the severing of said manipulating end portion from said retaining portion.

4,449,938

ENDODONTIC FILLING AND SEALING COMPOSITION

Richard B. Pollak, Los Angeles, Calif., assignor to Lee Pharmaceuticals, Inc., So. El Monte, Calif.

Filed Feb. 19, 1982, Ser. No. 350,404
Int. Cl.³ A61K 6/08
U.S. Cl. 523—116 12 Claims

1. A biologically compatible non-toxic composition suitable, when mixed, as an in situ curing endodontic filling material which comprises two separately packaged components as follows:

(a) a paste component comprising a low viscosity hydroxy terminated polydialkylsiloxane and a non-reactive hydroxy-free silicone oil diluent having a viscosity of from about 20 to 20,000 centistokes at 25° C. and comprising a polydialkylsiloxane; and

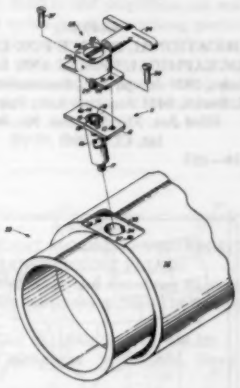
(b) a liquid component comprising (i) the reaction product obtained by refluxing at ambient pressure and a temperature of about 150° to about 175° C. under a nitrogen blanket in the absence of air and moisture (1) a dialkyltindicarboxylate in which the alkyl groups have from 1 to about 8 carbon atoms and the carboxylate groups contain from about 10 to about 18 carbon atoms and (2) a tetraalkyl orthosilicate, in the molar ratio of 1 to 3; (ii) uncombined alkyl orthosilicate and (iii) a non-reactive hydroxy-free silicone oil diluent having a viscosity of from about 20 to 120,000 centistokes at 25° C. and comprising a polydialkylsiloxane.

4,449,939

SAFE-ARM TRAINING SIMULATOR

William R. Matteson, Ridgecrest, Calif., assignor to United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 8, 1983, Ser. No. 502,404
Int. Cl.³ F41F 27/00; G09B 9/00
U.S. Cl. 434—12 17 Claims



1. A two-position, self-locking, safe-arm training device, comprising:

a baseplate having at least one hole through said baseplate;

a shaft mounted through said hole in said baseplate and having first and second holes in said shaft;

a spring mounted around said shaft and anchored at one end of said spring to said first hole in said shaft;

a housing mounted around said spring for keeping said spring under tension and for anchoring the other end of said spring, and having at least one roll slot in said housing;

a roll pin mounted in said second hole in said shaft and extending through said roll slot of said housing for confining said shaft in said housing, and for allowing said shaft to be switched between two set 90° positions, one of which corresponds to a safe position, and the other of which corresponds to an arm position, such that said spring returns said shaft to said safe position unless locked in said arm position.

4,449,940

SIMULATOR FOR WIND SURFING

Pierre L. Berger, 83310 Cogolin, La Mole, France

Filed Nov. 9, 1981, Ser. No. 319,393
Claims priority, application France, Nov. 12, 1980, 80 24009
Int. Cl.³ G09B 9/06
U.S. Cl. 434—66 13 Claims

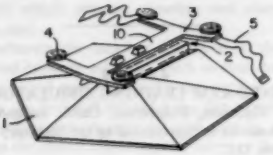
1. A simulator for a wind surfer adapted to be placed on a variety of surfaces comprising:

(a) a foundation comprising at least one webbed element;

(b) means for supporting a wind surfer;

(c) means for pivotably connecting said foundation and said supporting means;

(d) means for braking pivotal movement of said supporting means; and



(e) means for longitudinally and transversely oscillating said supporting means with respect to said foundation.

4,449,941

EDUCATIONAL DEVICE FOR LEARNING GEOGRAPHICAL NAMES AND LOCATIONS

John McGuire, 2930 Joseph Ave., Sacramento, Calif. 95825, and David G. Bories, 8421 Ascolano Ave., Fair Oaks, Calif. 95628

Filed Jan. 31, 1983, Ser. No. 462,421
Int. Cl.³ G09B *29/10*
U.S. Cl. 434—153 **7 Claims**

1. An educational aid comprising:
a. a board having a front surface,
b. a map of a political area imprinted on the front surface,
c. a separate lamp mounted on the top surface within the bounds of each subarea,
d. a battery,
e. a receptable mounted on the board and having a different set of contacts connected to each lamp and connecting means for connecting to the battery, and
f. a plurality of cartridges, one for each subarea, adapted to be inserted into the receptable one at a time, each cartridge connecting one of said lamps to said battery when inserted into said receptacle.

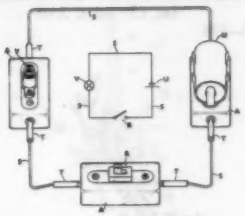
4,449,942

KIT FOR THE ASSEMBLY OF ELECTRICAL CIRCUITS

Yechiel Salit, 12 Alexander Yanai St., Tel-Aviv, Israel

Filed Jun. 25, 1982, Ser. No. 392,328
Claims priority, application Israel, Jul. 3, 1981, 63231
Int. Cl.³ G09B *23/18*
U.S. Cl. 434—224 **10 Claims**

1. A kit for the assembly of electrical circuitry, particularly for didactical purposes, comprising:
a selection of electrical or electronics components;
each component being mounted on an insulated board having extentions of a conductive material to which the component's terminals are electrically connected;
the boards being adapted to be interchangeably and releasably mounted on a base in the form of a prismatic block made of a rigid, electrical insulating material having a bottom, side and top surfaces;
metallic sockets installed within the blocks;



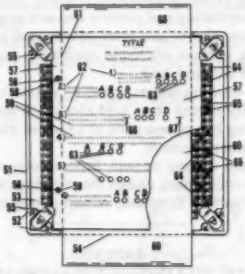
means for releasably fastening the boards to the blocks, thereby establishing electrical connection between a conductive extention thereof and a socket; and
openings formed in side surfaces of the block and in each socket for the insertion of wire plugs thereinto.

4,449,943

TEACHER PREPARED FORMATS FOR INSTRUCTIONAL APPARATUS

James R. Harte, 10 W. Concord, Kansas City, Mo. 64112

Filed Aug. 2, 1982, Ser. No. 384,234
Int. Cl.³ G09B *3/08*
U.S. Cl. 434—334 **2 Claims**



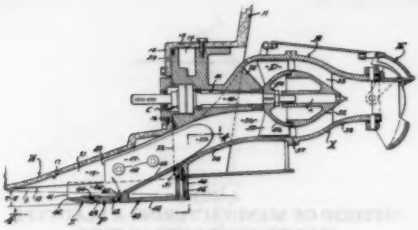
1. What is claimed is: an invention comprised of two parts, the first part being a sheet of paper, plastic, or similar material, through which holes have been punched in a precise manner so that these holes correspond to shallow and / or deep depressions contained in a holding frame used in conjunction with this invention; and a second part of this invention being a sheet of paper, plastic, or similar material, that has printed on its surface a precise pattern of dots or other indicating means, that when used in conjunction with the first part of this invention by placing the second sheet under the first sheet in such a manner that it will indicate to an instructor which of the through holes in the first part will be above shallow depressions, and which of the holes in the sheet will be above deep depressions that are contained in a holding frame that is used with this invention: this arrangement allows an instructor to rapidly and economically prepare instructional formats in any area the instructor chooses; said formats providing the student with immediate feedback as to the correctness or incorrectness of his or her answer choices, when said formats are used in conjunction with the instructional apparatus in previously noted patents.

4,449,944

VARIABLE INLET HYDROJET BOAT DRIVE

Kenneth R. Baker, Woodland Hills, and Robert T. De Vault, Simi Valley, both of Calif., assignors to Maritec Corporation, Canoga Park, Calif.

Filed Jan. 2, 1979, Ser. No. 591
Int. Cl.³ B63H *11/04*
U.S. Cl. 440—47 20 Claims



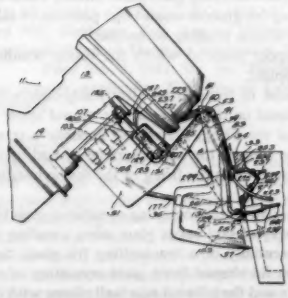
1. In combination:
a boat hull having a tunnel opening flush at the bottom thereof for the reception of propulsion water and inclined upwardly as it extends rearwardly to an interface opening at the stern thereof;
a hydrojet drive unit having a pump housing secured to the boat hull and with a propulsion water flow passage continuing rearwardly from a lip at the hull bottom and from said interface opening, and a prime mover driven impeller in said passage to deliver propulsion water through a nozzle;
and a ram-scoop extending forwardly from the lip of the hydrojet drive unit and with a planar bottom spaced below the hull bottom and enclosing the tunnel and defining a restricted inlet opening for high speed boat operation, there being a secondary inlet opening in the planar bottom of the ram-scoop and closed by a panel coplanar therewith and free to open in response to an imbalance between exterior slipstream pressure and interior tunnel pressure so as to augment the flow of propulsion water into the tunnel for low speed boat operation.

4,449,945

OUTBOARD MOTOR MOUNTING ARRANGEMENT

Arthur R. Ferguson, Northbrook, Ill., assignor to Outboard Marine Corporation, Waukegan, Ill.

Filed Aug. 17, 1981, Ser. No. 293,324
Int. Cl.³ B63H *21/26*
U.S. Cl. 440—53 42 Claims



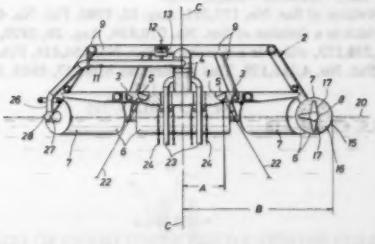
1. A marine propulsion device comprising a transom bracket including a portion which is adapted for mounting to the rear of a boat transom and which includes an uppermost part, and a pair of laterally spaced arms extending upwardly from said mounting portion above said uppermost part and without extending forwardly of the rear of the transom and including respective upper ends, a swivel bracket comprising a lower unit mounting portion having therein a bore, and a pair of laterally spaced arms extending upwardly from said swivel bracket mounting portion and including respective upper ends, means adjacent said upper ends of said swivel bracket arms for mounting said swivel bracket to said transom bracket for pivotal movement about a tilt axis which is horizontal when said transom bracket is boat mounted and relative to a running position with said swivel bracket mounting portion located adjacent said transom bracket mounting portion, a propulsion unit including an internal combustion engine and a propeller mounted for rotation and driven by said engine, and means including a king pin fixed to said propulsion unit and received in said bore of said swivel bracket mounting portion so as to connect said propulsion unit to said swivel bracket for common movement of said propulsion unit with said swivel bracket about said tilt axis and for pivotal steering movement of said propulsion unit relative to said swivel bracket about a second axis transverse to said tilt axis.

4,449,946

SINGLE-POINT MOORING SYSTEM FOR TRANSFERRING FLUIDS

Jan Versluis; Johan deGroot, and Anton van Baalen, all of The Hague, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Oct. 25, 1982, Ser. No. 436,226
Claims priority, application Netherlands, Nov. 16, 1981, 8105167
Int. Cl.³ B63B *21/52*
U.S. Cl. 441—4 2 Claims



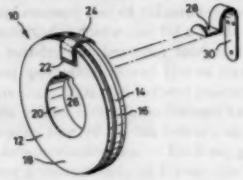
1. A single-point mooring system for transferring fluids, comprising a central element, connecting means carried by said central element for operatively securing anchor cables thereto, a rotatable line coupling and a rotatable element rotatably connected to the central element, the rotatable element being provided with a substantially annular buoyancy unit, with means for mooring a ship and with a fluid line connected to the rotatable line coupling, characterized in that the distance between any point on the outer circumference of the buoyancy unit and the axis of rotation is at least twice as large as the distance between each anchor cable connecting means and the axis of rotation, and being further characterized in that the central element is connected to the rotatable element by means of a bearing capable of absorbing both axial and radial forces, said bearing being fitted in such a manner that the bearing is entirely above the water surface during normal operation, with said rotatable element comprising a supporting frame that is on one side connected to the buoyancy unit and on the other side to the bearing.

4,449,947

FLOTATION DEVICE

Richard A. Brault, 283 Sherbourne St., Apt. 2, Toronto, Canada

Filed Jun. 29, 1982, Ser. No. 393,508
Int. Cl.³ B63C 9/10
U.S. Cl. 441—81 4 Claims



1. A flotation device comprising:

(a) a flotation member comprising a disc shaped buoyant body of resiliently flexible foamed plastics material having a cylindrical shaped support face extending about a perimeter thereof and across the full width thereof, said buoyant body being sufficiently resilient at said support surface to permit said support surface to be resiliently deformed,

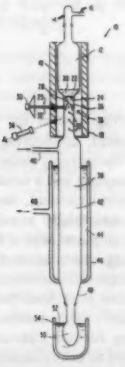
(b) a retrieval member comprising an elongated web of flexible material, said web being connected to said flotation member and adapted so as to be locatable in an operable position extending from its connection with said flotation member and a storage position extending about and resiliently depressing said support face to be retained thereon by the resilient reaction of the body.

4,449,948

METHOD OF INTRODUCING SODIUM AMALGAM INTO LAMPS AND LAMP CONTAINING SODIUM AMALGAM PARTICLES

Scott Anderson, Champaign, Ill., assignor to APL Anderson, Inc., Oakwood Village, Ohio

Division of Ser. No. 177,391, Aug. 12, 1980, Pat. No. 4,386,050, which is a division of Ser. No. 070,839, Aug. 29, 1979, Pat. No. 4,238,173, which is a division of Ser. No. 654,416, Feb. 2, 1976, Pat. No. 4,216,178. This application Mar. 17, 1983, Ser. No. 476,125
Int. Cl.³ H01J 9/395
U.S. Cl. 445—18 8 Claims



1. A method of filling a gas discharge lamp with an accurately controllable quantity of high purity sodium amalgam comprising the steps of:

(a) providing a volume of free-flowing amalgam particles composed of from about 2 to about 30 weight percent sodium and from about 98 to about 70 weight percent mercury, said particles containing less than 10 ppm of sodium oxides;

(b) portioning out a volume of the particles corresponding to a desired quantity of sodium amalgam; and

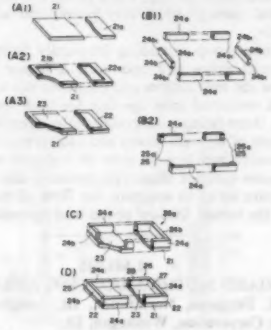
(c) introducing the portioned volume of amalgam particles into a gas envelope of a gas discharge lamp.

4,449,949

METHOD OF MANUFACTURING A FLAT-TYPE FLUORESCENT DISPLAY TUBE

Goro Eto; Atsushi Nishimuro, and Noriyoshi Fukuda, all of Mobara, Japan, assignors to Futaba Denshi Kogyo K.K., Mobara, Japan

Division of Ser. No. 149,748, May 14, 1980, abandoned. This application Sep. 23, 1982, Ser. No. 422,085
Claims priority, application Japan, May 16, 1979, 54-59089
Int. Cl.³ H01J 9/2
U.S. Cl. 445—24 3 Claims



1. A method of manufacturing a front plate used in an envelope of flat-type fluorescent display tube comprising the steps of:

preparing a flat glass upper plate,

applying a fusion bonding glass paste formed essentially of a low-melting frit glass to inside edge portions of said upper plate by a screen printing technique,

firing said upper plate to which the fusion bonding glass paste is applied,

spraying a mist of transparent electrically-conductive film forming liquid on the inside surface of said upper plate at the time of the firing, thereby to deposite a transparent conductive film on the inside surface of said upper plate simultaneously with the firing of the fusion bonding glass paste, and

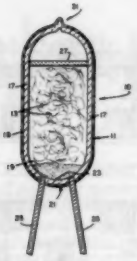
bonding side wall plates consisting of pillared glass blocks to the periphery of said upper plate using a sealing medium formed essentially of a low-melting frit glass, therby to form a box lid shaped front plate consisting of said flat upper plate and the pillared side wall plates, with only the inside surface of the upper plate of said box lid shaped front plate being coated with the transparent conductive film.

4,449,950

METHOD OF MAKING PHOTOFLASH LAMP TO PREVENT SHRED MIGRATION INTO TIP PORTION OF LAMP ENVELOPE DURING SEALING THEREOF

Andre C. Bouchard, Peabody, Mass., assignor to GTE Products Corporation, Stamford, Conn.

Filed Mar. 1, 1982, Ser. No. 353,317
Int. Cl.³ F21K 5/02; H01J 9/40
U.S. Cl. 445—28 6 Claims



1. A method of making a photoflash lamp, said method comprising:

providing an elongated, light-transmitting glass tubular member having opposing open ends;

sealing a first open end of said glass tubular member, said sealed first end including a pair of lead-in wires secured therein each having an end portion having access to the interior of said tubular member;

positioning a quantity of primer material within said tubular member through an opposing, second open end thereof, said quantity of primer material electrically connected to said end portions of said lead-in wires;

positioning a predetermined quantity of combustible, light-producing material within said tubular member through said opposing, second open end thereof;

frictionally positioning a thin member having an external configuration substantially similar to the internal configuration of said tubular member within said tubular member through said opposing, second open end thereof, said thin member engaging said combustible, light-producing shred material to prevent migration of said material toward said opposing, second open end of said glass tubular member;

introducing a combustion-supporting gas within said tubular member through said opposing, second open end; and

thereafter sealing said second end of said tubular member above said thin member to define an envelope.

4,449,951

METHOD OF ADJUSTING THE ELECTRODE SPACINGS IN SYSTEMS OF ELECTRON-BEAM TUBES

Eberhard Nill, Esslingen, Fed. Rep. of Germany, assignor to International Standard Electric Corporation, New York, N.Y.

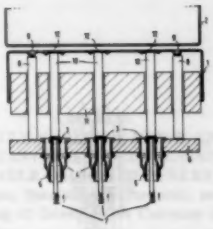
Filed Sep. 3, 1981, Ser. No. 298,848
Claims priority, application Fed. Rep. of Germany, Sep. 24, 1980, 3035970
Int. Cl.³ H01J 9/18
U.S. Cl. 445—34 3 Claims

1. A method of adjusting the electrode spacings in an electron-beam tube of the type wherein a cathode electrode mounting plate is provided with at least one cathode electrode mounted in a holding sleeve and wherein said mounting plate is mounted within a second electrode having electron apertures therein which are respectively axially aligned with each of the cathode electrodes and separated therefrom by a predetermined electrode spacing, said method comprising the steps of:

(a) inserting a guide plate into said second electrode, said guide plate having at least one guide hole therein respectively axially aligned with said apertures and having at least one spacing hole therein which is spaced apart from said guide holes;

(b) inserting an axially extending cathode jig member into each of said guide holes until one end portion thereof engages said second electrode, and each cathode jig member having a predetermined axial length;

(c) inserting an axially extending spacing jig member into each of said spacing holes until one end portion thereof engages said second electrode, and each spacing jig having a predetermined axial length which is less than the



axial length of said cathode jig member by an amount equal to said predetermined electrode spacing;

(d) moving said mounting plate into engagement with the other end of said spacing jig member;

(e) moving said cathode electrodes in said sleeve until the ends of said cathode electrodes engage the other ends of said cathode jig members;

(f) fastening said cathode electrodes to said sleeves;

(g) removing said guide plate from said second electrode;

(h) inserting said mounting plate with its fastened cathode electrodes into said second electrode; and,

(i) fastening said mounting plate to said second electrode.

4,449,952

METHOD OF OPERATING A COLD CATHODE-COLD RESERVOIR THYRATRON

Arthur Tauber, Long Branch; Robert D. Finnegan, West Long Branch, and Frederick Rothwarf, Toms River, all of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 9, 1979, Ser. No. 83,071
Int. Cl.³ H01J 7/18
U.S. Cl. 445—55 4 Claims

1. Method of providing a cold cathode-cold reservoir thyratron for laser/radar and other systems with an operating pressure plateau of approximately 10^{-3} atmosphere in the thyratron, comprising forming the hydride of a compound that simultaneously exhibits a large capacity for storing hydrogen, a desorption pressure plateau between 10^{-3} and 10^{-4} atmosphere of hydrogen and rapid desorption and recovery rate, placing the hydrided compound in the cathode structure of the thyratron, and then pumping the tube down to its operating pressure plateau of approximately 10^{-3} atmosphere, the hydrided compound acting as a ballast to maintain that partial pressure of hydrogen at room temperature.

4,449,953

ARTICULATED COUPLING

Samuil S. Nikomarov; Anatoly M. Kochnev; Vladimir B. Goldobin; Jury M. Sarapulov, all of Perm, and Isaak Y. Valdman, Kungur Permskoi, all of U.S.S.R., assignors to Permsky Filial Vsesojuznogo Nauchno-Issledovatelskogo Instituta Burovoi Tekhniki, U.S.S.R.

Filed Sep. 10, 1981, Ser. No. 301,023
Claims priority, application U.S.S.R., Sep. 12, 1980, 2981886
Int. Cl.[3] E21B *4/02, 17/02*
U.S. Cl. 464—19 6 Claims

1. An articulated coupling, comprising

a first cylindrical half-coupling having an end face;

a second cylindrical half-coupling disposed substantially coaxially with said first half-coupling and having an end face facing the end face of said first half-coupling;

a first recess formed in said end face of said first half-coupling facing said second half-coupling, said first recess being shaped as a cylindrical annular groove having external and internal walls;

a second recess formed in said end face of said second half-coupling facing said first half-coupling, said second recess being shaped as a cylindrical annular groove having external and internal walls;

a hollow cylindrical cage installed substantially coaxially in said grooves of said half-couplings with a clearance from said walls of said recesses;

openings formed in said first half-coupling and passing radially through said external and internal walls of said first recess groove;

openings formed in said second half-coupling and passing radially through said external and internal walls of said second recess groove;

openings formed through said cage substantially coaxially with said openings of the first and second half-couplings;

rollers installed with a clearance in said substantially coaxial openings of said first and second half-couplings and said cage and resting on both walls of said groove and on said cage; and

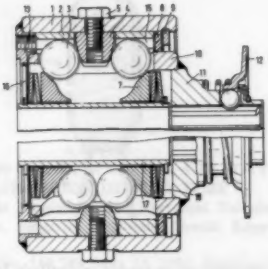
means for retaining said rollers in said openings comprising a casing and elastic gaskets, said casing being mounted on said gaskets outside said half-couplings with a clearance from said half-couplings.

4,449,954

OVERLOAD CLUTCH

Werner Krude, Siegburg-Kaldauen, Fed. Rep. of Germany, assignor to Uni-Cardan Aktiengesellschaft, Siegburg, Fed. Rep. of Germany

Filed Jun. 22, 1981, Ser. No. 275,601
Claims priority, application Fed. Rep. of Germany, Jun. 24, 1980, 3023541
Int. Cl.[3] F16D *7/06*
U.S. Cl. 464—36 7 Claims



1. An overload clutch comprising a driving member and a driven member adapted to be placed in torque transmitting relationship with each other, a cage nonrotatably connected with one of said driving member and said driven member and formed with apertures, a plurality of dog members received in said apertures, axially spring-biased cam means mounted on said one member engaging said dog members to urge said dog members to move at least in directions radially of said clutch, a plurality of cam elements mounted on the other of said driving and driven members adapted to engage said dog members, control ring means operatively interposed between said driving and driven members, windows formed in said control ring means having said cam elements extending therethrough, said windows being formed with a circumferential dimension greater than the circumferential dimension of said cam elements to enable said control ring means to undergo limited circumferential movement relative to said other member, and formations in said control ring means adapted to receive said dog members therein thereby to effect torque transmitting engagement of said clutch, said cam elements and said axially spring-biased cam means being configured to control movement of said dog members into and out of torque transmitting engagement relative to said formations in accordance with the relative circumferential positioning between said control ring means and said other member.

4,449,955

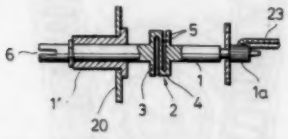
OPERATING SHAFT MECHANISM IN A PUSHBUTTON TUNER

Tadaaki Watanabe, and Yoshio Tanaka, both of Saitama, Japan, assignors to Clarion Co., Ltd., Tokyo, Japan

Filed Aug. 6, 1981, Ser. No. 290,442
Claims priority, application Japan, Aug. 8, 1980, 55-111724[U]
Int. Cl.[3] F16D *3/52;* F16H *35/18;* H03J *5/06*
U.S. Cl. 464—78 3 Claims

1. An operating shaft for a tuner, comprising an integral shaft member formed from a plastic material, said shaft member including a manual shaft portion, a driven shaft portion and an enlarged portion which connects said manual and driven shaft portions, said enlarged portion having first means defining a plurality of first slits therein for imparting flexibility to said enlarged portion, and second means provided at an end of said manual shaft portion remote from said enlarged portion for facilitating support of a knob on said end of said manual

shaft portion, said second means including two spaced, axially extending wall portions at said end of said manual shaft portion, which wall portions define an axially extending second slit, said second means including an axially extending strengthening rib disposed in said second slit and extending between said wall portions, said rib being integral with said shaft member and being capable of elastic deformation when a large force



is applied thereto as a knob is pressed onto said end of said manual shaft portion of said shaft member, and wherein said rib is disposed in the central region of said second slit and extends axially from the bottom of said second slit partway to the open axially outer end of said second slit so that the axially outer end portion of said second slit is free of said rib, the thickness of said rib being substantially smaller than the width of said second slit.

4,449,956

CONSTANT-VELOCITY UNIVERSAL JOINT

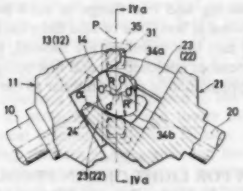
Yasuo Ueno, 3-17-3-209 Higashinogawa, Komae-shi, Tokyo, Japan

Filed Jun. 16, 1981, Ser. No. 274,151

Claims priority, application Japan, Jun. 17, 1980, 55-81661; Jun. 17, 1980, 55-81660; Oct. 28, 1980, 55-151044

Int. Cl.³ F16D *3/30*

U.S. Cl. 464—149 **1 Claim**



1. A constant-velocity universal joint for transmitting a rotary motion from a driving shaft to a driven shaft, comprising:

a yoke member formed at the leading end of the driving shaft and provided with a plurality of yokes spaced circumferentially and containing flat lateral contact surfaces;

a yoke member formed on the driven shaft and provided with a plurality of yokes meshed across circumferential gaps with the yokes of the yoke member of the driving member and containing lateral contact surfaces, the opposed lateral contact surfaces of the adjacent yokes of the yoke members of the driving shaft and the driven shaft held in a meshed condition being substantially parallel with the lines perpendicularly intersecting the tangential lines of the pitch circle of said yoke members; and

a transmission member consisting of a plurality of rotary members each formed in the shape of a cylinder having a substantially straight longitudinal side wall and set in position in the gaps formed between the opposed lateral contact surfaces of the yokes of the yoke members of the driving shaft and the driven shaft, a retainer formed of frames for retaining the rotary members on the pitch circle thereof in the plane perpendicular to the axis of the retainer and a guide member serving to retain the frames at a fixed circumferential pitch and to hold in position the yokes of the driving shaft and the driven shaft, each of said rotary members being provided with a rotation axis in the radial direction of the retainer, said guide member being provided with two sets of spherical surfaces having respective centers deviating equally from the intersection of the axes of the driving and driven shafts in the opposite directions on the rotational axis of the retainer, one set of the spherical surfaces serving to retain the circumferential surfaces of the yokes of the driving shaft in the radial direction thereof and the other set thereof serving to retain the yokes of the driven shaft in the radial direction thereof.

4,449,957

AUTOMATICALLY VARIABLE DRIVE APPARATUS HAVING AT LEAST ONE V-BELT RUNNING OVER VARIABLE DIAMETER PULLEYS

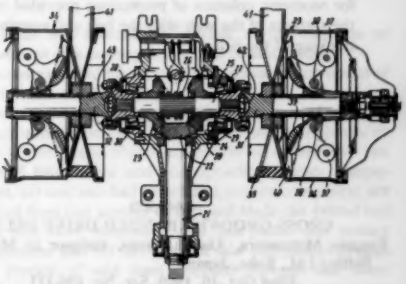
Hendrikus J. Kapaan, Ijsselstein, Netherlands, assignor to SKF Industrial Trading & Development Company B.V., Nieuwegein, Netherlands

Filed Nov. 15, 1978, Ser. No. 960,924

Claims priority, application Netherlands, Nov. 16, 1977, 7712625

Int. Cl.³ F16H *55/56, 3/14;* F16D *21/04*

U.S. Cl. 474—14 **7 Claims**



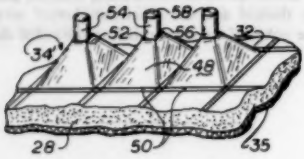
1. In an automatically variable drive apparatus including a driving section and a driven section which are coupled together by means of at least one V-belt running over adjustable diameter pulleys, in which each pulley comprises a first half-pulley member fixed on for rotation with a first shaft rotatably mounted in a housing in each of said drive and driven sections and a second half-pulley member axially slidably mounted on said first shaft for rotation therewith, said pulley including means for adjusting the relative axial location of said second half-pulley member in response to the rotational velocity of said shaft, said first shaft of the driving section being driven by a driving shaft via a drive conical gear mounted on said driving shaft which engages with at least one first conical gear mounted for free rotation around said first shaft, means for selectively coupling said first conical gear to said first shaft for rotation therewith; the improvement wherein said first shaft of the driving section comprises at least one bearing supported central shaft around which said first conical gear can rotate, a first flange at one end of said central shaft, said flanged central shaft together with said driving section being a first integral assembly, at least one lateral shaft on which is mounted one of said adjustable diameter pulleys which is provided at one end with a second flange to form a lateral section being a second integral assembly, the second flange being removeably fixed to the first flange of the central shaft, thereby allowing a detachable construction of said two integral assemblies.

4,449,958

POSITIVE TRACKING PULLEY AND BELT CONSTRUCTION

Rene A. Conrad, 215 Olive Hill La., Woodside, Calif. 94062

Filed Sep. 24, 1981, Ser. No. 305,288
Int. Cl.³ F16G 1/28; F16H 7/02; B65G 23/06
U.S. Cl. 474—205 1 Claim



1. An endless belt apparatus comprising:

an endless belt including a planar net having a longitudinal extent and a pair of parallel surfaces, a plurality of truncated pyramidal projections converging away from one of the surfaces of the web, each truncated pyramidal projection including one cylindrical portion extending from the truncated pyramid and away from one of the surfaces of the web, the truncated pyramidal projections arranged in a plurality of columns for forming a matrix; and

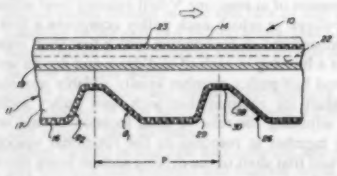
a pulley having a cylindrical shape in combination with the belt, provided with a plurality of grooves circumferential of the cylindrical outer surface of the pulley and arranged for receiving columns of projections provided on one of the surfaces of the web with the belt and assuring proper tracking of the belt.

4,449,959

CROSS GROOVED BANDED DRIVE BELT

Kaname Matsumura, Akashi, Japan, assignor to Mitsuboshi Belting Ltd., Kobe, Japan

Filed Oct. 10, 1980, Ser. No. 196,111
Int. Cl.³ F16G 5/00, 5/20
U.S. Cl. 474—238 20 Claims



1. In a power transmission belt having a plurality of V-belt elements retained in longitudinally extending laterally spaced relationship by a tie band, the improvement comprising

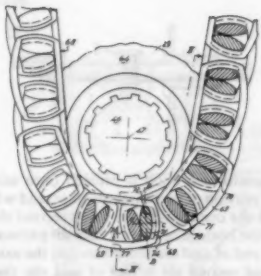
the provision of longitudinally spaced grooves in said V-belt elements opening away from the tie band, the grooves of the respective V-belt elements being substantially aligned transversely of the belt, each of said grooves being defined by an inclined transverse leading surface, a reversely inclined transverse trailing surface, and a bottom surface, the inclination of said leading and trailing surfaces to the longitudinal extent of the tie band being different whereby the groove defines an asymmetrical configuration in longitudinal cross section.

4,449,960

TORQUE CONVERTER

Cornelis van der Lely, 7, Brüschenrain, ZUG, Switzerland

Division of Ser. No. 969,703, Dec. 15, 1978. This application Oct. 27, 1980, Ser. No. 201,367
Int. Cl.³ F16G 51/80, 13/02
U.S. Cl. 474—242 28 Claims



1. A torque converter comprising an input shaft connected to an output shaft through a change speed mechanism, said mechanism comprising a first pair of flanges that form a pulley on said input shaft and a second pair of flanges on said output shaft that form a further pulley, at least one flange of each pair being axially displaceable relative to the other flange of said pair, an endless chain being mounted between the flanges of each pair, said chain including relatively movable links and transverse link members which connect said links to form said chain, each said link member having lugs with end faces for engaging said flanges, said end faces being substantially flat and parallel to the surface of the adjoining said flange, hydraulic means displacing said one flange of each pair in relative opposite directions, at least one of said links enclosing a space in which three said link members are located, the portion of each said link member enclosed by said link being symmetrical about a plane approximately perpendicular to the length of said chain.

4,449,961

PROCESS FOR LIGHT OLEFIN PRODUCTION

Nancy P. Forbus, Newtown, Pa., and Margaret M. Wu, Belle Mead, N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 449,912, Dec. 15, 1982, abandoned, which is a continuation-in-part of Ser. No. 335,796, Dec. 30, 1981, abandoned. This application Mar. 14, 1983, Ser. No. 474,842
Int. Cl.³ C07C 1/20
U.S. Cl. 585—640 20 Claims

1. In a catalytic process for converting a feedstock comprising the organic reactants methanol, methyl ether or mixtures thereof to a hydrocarbon product rich in ethylene and propylene, which process comprises contacting said feedstock under conversion conditions including a temperature between about 200° C. and 500° C. and a weight hourly space velocity for the organic reactants of between about 0.05 and 30, in a reaction zone with a catalyst comprising a crystalline aluminosilicate zeolite material characterized by a crystalline structure having pore windows formed by 8-membered rings of oxygen atoms, the improvement for enhancing catalyst lifetime comprising:

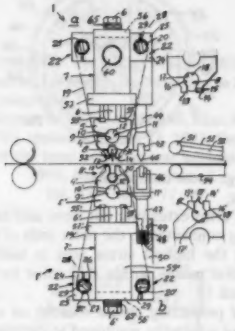
(i) simultaneously co-feeding to said reaction zone a catalyst lifetime enhancing amount of a gaseous elemental hydrogen-containing diluent, said diluent being co-fed into said reaction zone at a weight hourly space velocity of from about 0.003 to 20; and

(ii) maintaining said feedstock at a pressure between about 50 and 500 psig.

4,449,962
CUTTING/SEALING DEVICE FOR PLASTIC BAG MAKING MACHINES

Carlos R. D. S. Copia, Sao Paulo, Brazil, assignor to Maquinas Npu Ltda., Sao Paulo, Brazil

Filed Feb. 12, 1982, Ser. No. 348,161
Claims priority, application Brazil, Mar. 12, 1981, 8101449
Int. Cl.³ B31B *1/64*
U.S. Cl. 493—209 8 Claims



1. In a cutting/sealing device for plastic bag making machines of the type having upper and lower machine sections which are aligned vertically and are adapted to move toward and away from each other in a guillotine-like manner responsive to the action of machine cams, whereby the device may cut and seal a plastic film passing between the machine sections horizontally to produce plastic bags, said upper and lower machine sections including upper and lower sealing bars secured to heating bars in turn connected to upper and lower support members, said sealing bars being provided in their opposing faces with channel members of irregular cross section and in their opposite faces adjacent to the heating bars with semi-circular cross section channels, said semi-circular cross section channels being juxtaposed to like channels of the heating bars to provide upper and lower ducts adapted to receive electrical heating resistances to heat spaced forward and rear sealing surfaces of the upper and lower sealing bars immediately adjacent to said channel members of irregular cross section which seal the lateral sides or bottom of a plastic bag immediately following cutting of the plastic film, the improvement comprising said upper and lower channel members of irregular cross section each having flat parallel spaced wall sections defining mouths of the channel members, opposing intermediate concave wall sections leading from said flat parallel wall sections, short spaced parallel wall sections extending from the concave sections and being aligned with said flat parallel wall sections and flat bottom portions extending orthogonally between the ends of the short straight wall sections remote from the mouths of the channel members.

4,449,963
MACHINE FOR FOLDING LARGE-SIZE DRAWINGS OR DOCUMENTS

Marcel Archambault, Tours, France, assignor to Chapel Reprographie, Saint-Alban-Leysse, France

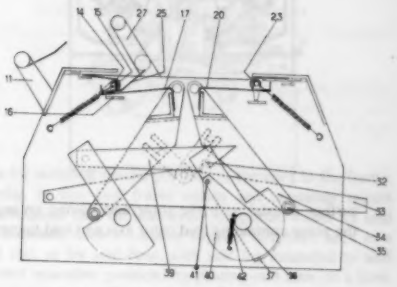
Filed Apr. 13, 1982, Ser. No. 367,902
Claims priority, application France, Apr. 4, 1981, 81 07005
Int. Cl.³ B65H *45/20*
U.S. Cl. 493—414 6 Claims

1. A machine for folding a sheet of flexible material, said machine comprising (1) means for defining two spaced apart folding and stop surfaces; (2) two corresponding fold-forming and fold-holding presser components respectively associated with said folding and stop surfaces; (3) a pair of blades; (4) support means for respectively supporting said blades in a mutually opposing relationship; and (5) means for oscillating said blades so that said blades are movable each in a predetermined direction of movement to respectively cooperate with said two folding and stop surfaces and said presser components so as to alternatively form folds in said sheet, wherein the improvement comprises:

said means for defining said folding and stop surfaces respectively include a pair of half-platens;

means for movably mounting and biasing each of said presser components towards a respective one of said half-platens;

support means for pivotally mounting each of the said half-platens so that each of said half-platens is pivotable with respect to a corresponding one of said presser components



about an axis substantially normal to the direction of movement of a corresponding one of said blades;

cam means mounted for rotation in response to movement of at least one of said blades;

lever means movable in response to the rotation of said cam means and cooperative with each of said half-platens so that as one of said blades moves toward a respective one of said half-platens and corresponding presser components, (a) said one-half platen and presser component are spaced from one another so that said blade can extend and fold said sheet inbetween said half-platen and presser component and (b) the other of said half-platens presses the portion of said sheet disposed between said other half-platen and corresponding other presser component against said other presser component.

4,449,964
DECANTING CENTRIFUGE

J. Eric H. Westberg, Lidingö, and H. Peter O. Unger, Stockholm, both of Sweden, assignors to Separex Teknik AB, Stockholm, Sweden

Filed Feb. 17, 1983, Ser. No. 467,387
Int. Cl.³ B04B *5/02*
U.S. Cl. 494—16 10 Claims

1. A decanting centrifuge, comprising

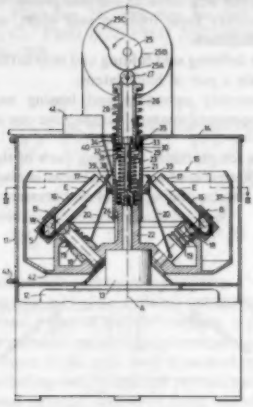
a motor,

a rotor having a vertical axis and drivingly connected with the motor for rotation about said axis,

at least one sample tube holder supported eccentrically on the rotor for rotation therewith and adapted to hold at least one generally cylindrical sample tube having an open end and adapted to contain liquid material, the sample tube holder being rotable with respect to the rotor and

means for selectively moving the sample tube holder and a sample tube held thereby between a first position wherein the open end of the sample tube is substantially closer to the rotor axis than is the opposite end, and a second position for centrifugally decanting a portion of the liquid sample from the sample tube the generatrix of the inner surface of the sample tube which is farthest from the rotor

axis being tangent at a point spaced from said opposite end of the sample tube to an imaginary circular cylindrical



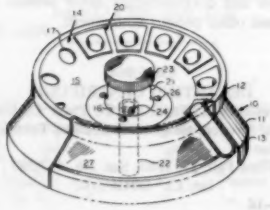
surface coaxial with the rotor and having an angle with the plane containing said rotor axis and said tangent point.

4,449,965

SHELL TYPE CENTRIFUGE ROTOR HAVING CONTROLLED WINDAGE

David H. Strain, Los Gatos, Calif., assignor to Beckman Instruments, Inc., Fullerton, Calif.

Filed Oct. 4, 1982, Ser. No. 432,488
Int. Cl.³ B04B *5/02*
U.S. Cl. 494—16 **6 Claims**



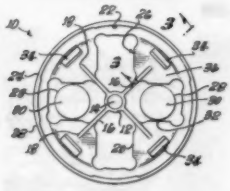
1. A shell-type centrifuge rotor comprising:
a frustoconical shell having a circular rim adjacent at least one end thereof, the lower end of said shell being open and the upper end having a coaxial recess and central opening, said recess having an inverted frustoconical sidewall, said sidewall having a plurality of apertures equally spaced and disposed an equal distance from said central opening;
a tube holder mounted one in each of said apertures for receiving a centrifuge test tube;
a hub, said hub mounted in said central opening and adapted for coupling said frustoconical shell to a drive means; and
means secured to said hub for partially enclosing the lower end of said frustoconical shell to reduce the windage of said rotor to a predetermined level.

4,449,966

CENTRIFUGE ROTOR BALANCING BOSSES

Alireza Piramoon, Santa Clara, Calif., assignor to Beckman Instruments, Inc., Fullerton, Calif.

Filed Jul. 19, 1982, Ser. No. 399,166
Int. Cl.³ B04B *5/02, 9/14*
U.S. Cl. 494—20 **3 Claims**



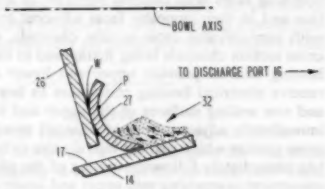
1. A centrifuge rotor comprising:
a central post;
a plurality of arms extending out from said central post;
a support ring connected to the outer ends of said arms, said ring being the highest stress area in said rotor during centrifugation means within said rotor for holding fluid samples; and
a plurality of projecting bosses located on said arms, said bosses being selectably machined to establish perfect balance of said rotor when it rotates on said spin axis.

4,449,967

CONVEYOR FLIGHT CONFIGURATION

John W. Caldwell, Glenside, Pa., assignor to Pennwalt Corporation, Philadelphia, Pa.

Filed Jun. 17, 1982, Ser. No. 389,313
Int. Cl.³ B04B *3/04*
U.S. Cl. 494—54 **13 Claims**



1. Apparatus for the continuous separation of solids/liquids mixtures into separate components by centrifugal action comprising an elongated bowl having an inner bowl surface, and including a cylindrical portion adapted to receive said solids/-liquids mixtures and a trunco-conical portion having a discharge port adapted to the discharge of solids separated from said mixture, said bowl being mounted for rotation about its longitudinal axis and conveying means including at least one blade having a leading surface facing in the direction of said port and a distal edge, said blade being helically and coaxially mounted within said bowl through the length of said bowl surface with the distal edge of said blade in a closely spaced, sweeping relationship to said bowl surface and means for rotating said bowl and said blade at a speed differential, the improvement which comprises providing along said leading surface of said blade and adjacent said distal edge thereof at least within part of said trunco-conical portion an arcuate surface portion of defined curvature and shape adapted to contact said solids after separation, said arcuate surface portion being defined by a concavity in said leading surface, said curvature of said arcuate surface having a profile defined in a plane through said axis whereby (i) a straight, first line tangent to the slope of said profile adjacent said distal edge and a

second line disposed in said plane and perpendicular to said bowl surface subtend an angle α within said concavity of between about 10° and 70° and (ii) a straight, third line tangent to the slope of said profile most distant from said distal edge and a fourth line disposed in said plane and perpendicular to said axis, subtends an angle β within said concavity of between about 7° and 90°, said arcuate surface portion, in use, propelling and tumbling separated solids towards said solids discharge port during rotation of said bowl and said blade at said speed differential.

4,449,968

POULTRY VACCINATION SYSTEM

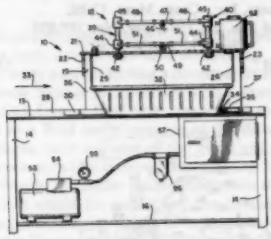
Walter L. Peterson, Gainsville, Ga., assignor to Select Laboratories, Inc., Gainesville, Ga.

Continuation-in-part of Ser. No. 241,495, Mar. 9, 1981, Pat. No. 4,316,464. This application Feb. 22, 1982, Ser. No. 350,597

The portion of the term of this patent subsequent to Feb. 23, 1999, has been disclaimed.

Int. Cl.³ A61M *11/00*

U.S. Cl. 604—24 **13 Claims**



1. A method of vaccinating poultry comprising placing a multiple number of chicks in an open top container, moving the container along a path until the container is located beneath at least one spray nozzle, ejecting a vaccine spray from the nozzle downwardly onto the upper portions of and into the eyes of the chicks in droplets wherein at least about 80 percent of the droplets are in a size range from about 90 microns in diameter to about 190 microns in diameter, removing the container from beneath the spray nozzle, and retaining the chicks in the container for a period sufficient for the normal movement of the chicks with respect to one another to cause some of the droplets of vaccine on the bodies of some of the chicks to make contact with the bodies of adjacent chicks.

4,449,969

DRAINAGE RECEPTACLE WITH SUPPORT FRAME

Russell J. Schweizer, Crystal Lake, Ill., assignor to The Kendall Company, Boston, Mass.

Filed Feb. 3, 1982, Ser. No. 345,504

Int. Cl.³ A61M *1/00*

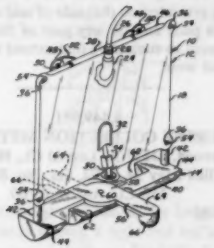
U.S. Cl. 604—322 **4 Claims**

1. A drainage receptacle and frame combination comprising:

a flat, generally rectangular container means having a pair of opposed flexible walls defining a chamber for receiving body fluids, and aperture means formed through the walls of said container at the four corners thereof;

a generally rectangular, substantially uniplanar frame means having a base, a pair of spaced, generally vertically oriented and parallel posts fixed to and extending upwardly from the base, each of said posts including an upper and a lower boss means for receiving respectively, upper and lower apertures of said rectangular container to fixedly mount said container means on said frame means, said base having a leg pivotally mounted centrally of the base, said leg having opposed end portions, said leg having an overall length less than that of said base and being movable from a first inoperative position with said opposed end portions of the leg located adjacent the base, generally parallel thereto, and a second operative position with opposed end portions of the leg extending outwardly from the base, at substantially right angles thereto, said leg being free of connection to the container;

an elongated cord means on the frame for supporting the container and frame; and



means for securing spaced portions of the cord to the frame;

whereby, in use, said frame means and container means combination may be selectively supported either by said cord means, from a suitable support structure such as a bed rail, or by said base with said leg extended to said second operative position, by placing said base on a horizontal support surface such as a floor.

4,449,970

VENTING DEVICE FOR STOMA BAGS

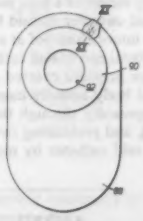
David R. Bevan, Carshalton Beeches, and Jeremy Layman, London, both of England, assignors to Downs Surgical Limited, Mitcham, England

Filed Sep. 3, 1981, Ser. No. 299,199

Claims priority, application United Kingdom, Sep. 9, 1980, 8029029

Int. Cl.³ A61M *1/00*

U.S. Cl. 604—333 **12 Claims**



1. A venting device for attachment in a folded reentrant position over the peripheral edge of a stoma bag, said stoma bag having two opposed external walls with opposed perforations in said walls wherein the filter covers the opposed perforations in each of the two external walls of the stoma bag, the filter comprising

a first elongated web,

a second web,

at least one gas-permeable pad containing an odourabsorbing substance and sandwiched between said webs, each pad having two major surfaces and an edge.

at least a portion of that major surface of each pad adjacent said second web being arranged such that, in use, it is exposed to and aligned with at least one of said opposed perforations,

a second portion of each pad being, in use, exposed to the atmosphere for venting of gas from the bag,

the said second web containing at least one perforation through which such portions of each gas-permeable pad are exposed, and such perforations in said second web being positioned for alignment respectively with the opposed perforations in the two external walls of the stoma bag,

an adhesive coating for attachment of the filter to the stoma bag being provided on that side of said second web remote from such pads and on any part of that side of said first web adjacent to such pads that extend beyond the edge of the second web.

4,449,971

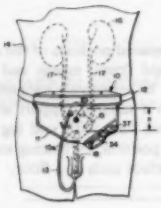
URINE COLLECTION METHOD

Charles D. Cawood, 11527 N. Lou Al Ct., Houston, Tex. 77024

Filed May 24, 1982, Ser. No. 381,071

Int. Cl.³ A61M *31/00*

U.S. Cl. 604—54 **2 Claims**



1. A method of collecting urine from an ambulatory patient wearing a urethral catheter having an externally-disposed proximal end and a distal end located within the patient's bladder, and an external urine collection bag communicating with the proximal end of said catheter for collecting urine from the bladder, comprising the steps of

locating said bag over the patient's abdomen with the upper portion of said bag disposed at the height of the patient's waist and the lower portion thereof located over the patient's pelvic region, supporting said bag from the patient's waist by means of a belt, and connecting said proximal end of said catheter to said bag for the discharge of urine into the interior thereof at a level slightly above the height of the distal end of said catheter, whereby, intraperitoneal positive pressure exerted on the patient's bladder during normal body activity causes urine to travel from the bladder upwardly through the catheter and into said collection bag, and preventing reverse flow of urine from said bag into said catheter by means of an anti-refluxing valve.

4,449,972

STOMACH FLUSHING DEVICES

Christian Krüger, Curtiusstrasse 4,, 2400 Lübeck, Fed. Rep. of Germany

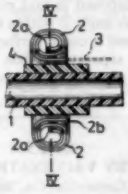
Filed Aug. 9, 1982, Ser. No. 406,512

Claims priority, application Fed. Rep. of Germany, Aug. 29, 1981, 3134251

Int. Cl.³ A61M *25/00*

U.S. Cl. 604—96 **2 Claims**

1. A device for flushing and/or draining a patient's stomach comprising a tube for introduction into the stomach through the oesophagus, and a balloon in the form of a double-walled hollow cylinder elastically and hermetically encircling said tube periphery at a predetermined point and in close contact therewith, said balloon being releasably joined to said tube and being inflatable through a thin pipe extending to the proximal extremity of said tube, including an obliquely-slotted sleeve member which is slidable on said tube, said balloon being rolled up in the manner of a cuff on said sleeve member prior to introduction through the oesophagus, said balloon being



subsequently unrollable from said sleeve member to lie flat against said tube.

4,449,973

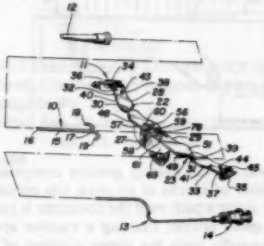
SMALL GAUGE, PRE-SPLIT CANNULA AND PROCESS FOR MANUFACTURE

Ronald B. Luther, Newport Beach, Calif., assignor to Luther Medical Products, Inc., Costa Mesa, Calif.

Filed Jun. 26, 1982, Ser. No. 397,059

Int. Cl.³ A61M *5/32*

U.S. Cl. 604—161 **11 Claims**



1. A cannula needle for insertion of a catheter therethrough, comprising:

A. A cannula including: a barrel portion having a longitudinal axis, distal and proximal ends, and internal and external walls;

i. one or more weakening grooves formed along the internal wall and parallel to the longitudinal axis;

ii. the barrel portion being produced by the sequential steps of grooving flatstock having parallel edges, and a thickness of about 2–8 mils, rolling the flatstock to form the barrel, and reducing the barrel in diameter to form a 14–36 gauge barrel diameter of continuous shape, closed, registered edges, and closed grooves in the internal wall, a cannula length of about ½"–6", and a uniform groove depth of about 30%–60% of the flatstock thickness using a 304–316 stainless steel, the barrel being work hardened, and the grooves and enclosed edges being embrittled by rolling and cold drawing;

iii. pre-split proximal ends and a needle portion being formed on the barrel; and,

B. separable wing holders, including a reinforcing barrel surrounding the proximal end of the cannula, a pre-split end being mounted within a separate wing; whereby,

i. during use, the cannula is adapted for minimal leakage of blood through the closed edges and grooves and for aspiration of blood through the cannula; and, ii. following use, the cannula is adapted to be split open, commencing from the proximal ends and continuing along the grooves, thereby enabling the cannula to be separated from the catheter, the wing holders being adapted

to secure each pre-split end of the cannula when being split open.

4,449,974

BODY FLUID DRAINAGE TUBE

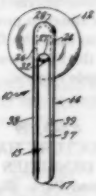
Walter Messingschlager, Rheinallee 1a, 4000 Dusseldorf 11, Fed. Rep. of Germany

Filed Jun. 29, 1982, Ser. No. 393,482

Claims priority, application Fed. Rep. of Germany, Feb. 26, 1982, 3206834

Int. Cl.³ A61M *25/00*

U.S. Cl. 604—175 **7 Claims**



1. A drainage tube for insertion through an access in a body wall to a body cavity, said tube comprising

a main body portion having a proximal front end portion and a distal bottom end portion with a drainage channel extending from a fluid inlet opening at the proximal front end to a fluid outlet opening at the distal bottom end, at least one wall segment of the distal end portion having a convex arch-like cross-section running from the proximal portion to the outlet opening, wherein the distal end provides a shield for protecting the drainage channel from being blocked,

a flexible flange member extending radially outwardly from the fluid inlet opening, and

a hollow stem member extending from the distal end of the main body portion as a continuation of, and in the same general direction as, the convex wall segment and away from the drainage channel, said hollow stem member extending in a substantially straight path which is substantially parallel to said flange member, and further wherein said hollow stem member has a cut-out portion extending along the entire length thereof on the side of the stem member which is furthest from the inlet opening, said cut-out stem member forming an open channel which is an extension of said drainage channel;

whereby when said drainage tube is inserted into said access the flange member will prevent the tube from being dislodged from said body cavity and body fluids may be drained through the drainage channel and the hollow stem member.

4,449,975

INTRAVENOUS ANCHOR AND WOUND SHIELD

Michael K. Perry, 3711 NE. Winn Rd., Kansas City, Mo. 64117

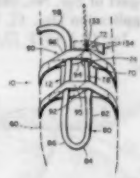
Filed Nov. 9, 1981, Ser. No. 319,693

Int. Cl.³ A61M *25/02*

U.S. Cl. 604—179 **8 Claims**

1. An intravenous catheter and anchoring set comprising:

a substantially flexible anchor-base having forward and rearward sides and right and left end portions, said base being elongated from right to left, said base having a first side that can form the inner skin-facing side of said base when said base is wrapped around a patient's arm, end-connecting means connecting said right and left end portions of said base together, and a catheter assembly, said catheter assembly having a hollow I.V. catheter having one end insertible into a patient's limb, a flexible tube attached to the other end of said catheter, and means securing said catheter assembly to said base, a skin anchor means of skin-gripping adhesive material secured to said base on and facing away from said inner skin-facing first side thereof and capable of adhering to the skin of a patient sufficiently to assist the attachment of said base to the arm of a patient by holding said base in place, said base having a notch means formed in at least one end thereof and providing forward and rearward bands and an interconnecting portion extending transversly to and between



said band connecting said bands, the length of said base, each of said bands having a right end and a left end, said bands each having a length and flexibility for freely wrapping substantially completely about a patient's arm,

means releasably attaching the ends of at least one of said bands together in an adjustable manner accomplishing variations in size of the space enclosed by said one band and defining said end-connecting means.

4,449,976

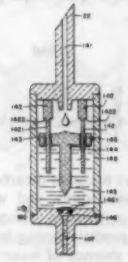
DEVICE FOR PRESERVING CONTINUITY OF INTRAVENOUS FLOW

Dean L. Kamen, Bedford, N.H., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Continuation-in-part of Ser. No. 266,072, May 21, 1981. This application Nov. 9, 1981, Ser. No. 319,222

Int. Cl.³ A61M *5/14*

U.S. Cl. 604—254 **8 Claims**



1. A device for preserving continuity of fluid flow from a reservoir, such device comprising:

a housing defining a chamber having an input for receiving fluid from the reservoir and an output port;

a float, within the housing, responsive to the fluid level in the chamber;

a mating valve and seat, located in the fluid path between the output port and the chamber;

such valve being mechanically linked to the float, and disposed so as to mate at an area of contact with the seat when the fluid level has fallen to a predetermined level;

such seat being formed as an annular face of the housing and defining an opening to the output port;

at least one of the valve and the seat having a groove on its surface extending entirely across the area of contact, so that when the valve is seated there is permitted flow only at a reduce rate through the groove past the valve to the output port, whereby the flow of fluid abruptly shifts to a

reduced rate when the fluid level has fallen to the predetermined level.

4,449,977

ABSORBENT PRODUCTS, PROCESSES AND COMPOSITIONS

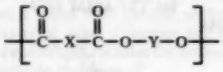
Ralf Korpman, Bridgewater, N.J., assignor to Johnson & Johnson, New Brunswick, N.J.

Continuation-in-part of Ser. No. 088,882, Oct. 29, 1979, abandoned. This application Dec. 11, 1981, Ser. No. 329,642

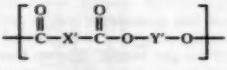
Int. Cl.³ A61F *13/16*

U.S. Cl. 604—366 **9 Claims**

2. A flexible non-disintegrative absorbent product which is capable of absorbing and retaining water, comprising a water-insoluble substantially non-swelling matrix of a thermoplastic co-polyester polymer bearing uniformly dispersed particulate, water-insoluble, water-swellable organic polymer absorbent, wherein said co-polyester is a polymeric ester of at least two different ester units, each ester unit being a condensation product of a dicarboxylic acid and an aliphatic diol, said ester units being represented by the formulas:



and



wherein X and X' are nuclei of dicarboxylic acids and Y and Y' are nuclei of aliphatic diols, and wherein the co-polyester polymer possesses a thermal softening temperature below about 225° C., said product having been manufactured using a hot melt and in the absence of water.

4,449,978

NONWOVEN PRODUCTS HAVING LOW RESIDUAL FREE FORMALDEHYDE CONTENT

John G. Iacoviello, Allentown, Pa., assignor to Air Products and Chemicals, Inc., Allentown, Pa.

Continuation-in-part of Ser. No. 297,583, Aug. 31, 1981, abandoned. This application Apr. 1, 1983, Ser. No. 481,216

Int. Cl.³ A61F *13/16*; **B05D** *3/02*; **B32B** *23/16*; **D04H** *1/64*

U.S. Cl. 604—372 **46 Claims**

27. A nonwoven fabric having a low residual free formaldehyde content comprising a loosely assembled web of fibers bonded together with a binder which comprises an interpolymer of vinyl acetate/ethylene/N-methylol acrylamide/acrylamide, the interpolymer containing about 5 to 40 wt% ethylene and an amount of N-methylol acrylamide and acrylamide which is about 3.0 to 10 wt% of the interpolymer, the N-methylol acrylamide being about 1.75 to 3.5 wt% and the acrylamide about 1.25 to 8.25 wt%, the nonwoven fabric characterized by a free formaldehyde content after drying and curing of less than 50 to 60 ppm at a 10 to 100 wt% binder add-on, on a dry basis.

30. The invention of claim **27** in which the nonwoven fabric is a disposable diaper.

37. A method for the preparation of a nonwoven product which comprises applying to a nonwoven mass of fibers a latex comprising an interpolymer of vinyl acetate/ethylene/an N-methylol acrylamide/an acrylamide dispersed in water, the interpolymer containing about 5 to 40 wt% ethylene and an amount of the N-methylol acrylamide and acrylamide which is about 3 to 10 wt% of the interpolymer, the N-methylol acrylamide being about 1.75 to 3.5 wt% and the acrylamide about 1.25 to 8.25 wt%, heating to remove the water and to bond the fibers together with the interpolymer, the latex being applied to the nonwoven mass of fibers to provide a sufficient amount of interpolymer add-on to bind the fibers together to form a self-sustaining web, and the nonwoven product characterized by a low free formaldehyde content.

4,449,979

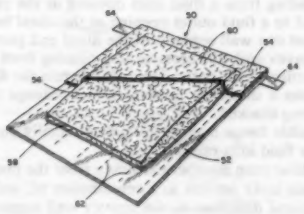
ABSORBENT STRUCTURE HAVING GRADIENT DENSITIES

Dennis C. Holtman, Orland Park, Ill., assignor to Johnson & Johnson Baby Products Company, New Brunswick, N.J.

Filed Aug. 26, 1980, Ser. No. 181,539

Int. Cl.³ A41B *13/02*

U.S. Cl. 604—379 **14 Claims**



1. An absorbent structure comprising an absorbent batt of loosely compacted cellulosic fibers substantially of rectangular shape wherein the longitudinal sides are longer than the transverse ends, said batt having gradient densities whereby the density of the batt increases along a longitudinal line starting from the central portion of the batt to each transverse end, the density in a cross direction being substantially constant on any given line.

4,449,980

METHODS OF MAKING INTRA-VAGINAL DEVICES AND/OR INTRA-VAGINAL DEVICES

Thomas D. Millar, and David M. Miller, both of Hamilton, New Zealand, assignors to AHI Operations Limited, Manukau City, New Zealand

Filed Jun. 3, 1981, Ser. No. 269,974

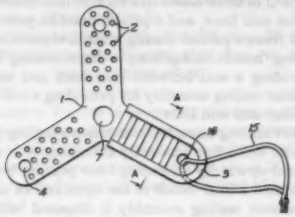
Claims priority, application New Zealand, Jun. 9, 1980, 193976

Int. Cl.³ A61M *7/00*

U.S. Cl. 604—890 **15 Claims**

1. An intravaginal device for the sustained release of a physiologically active substance into the vagina of a mammal when inserted therein, including a resilient physiologically-inactive supporting skeleton and a polymeric coating having a physiologically-active ingredient incorporated therein moulded over said skeleton to form a physiologically-active skin thereupon, said physiologically active ingredient and said skin affording a sustained release of said physiologically-active ingredient during contact with the body fluids of said mammal, and said skeleton including means for increasing the surface area of the physiologically-active skin exposed to said body fluids com-

prising at least three broad lobes radiating in a plane from a central body portion, each of which lobes is perforated with a



network of holes over which the skin is moulded to provide an undulated skin surface over said skeleton and increase the skin surface area exposed to body fluids.

4,449,981

GLASS ENCAPSULATED MATERIALS

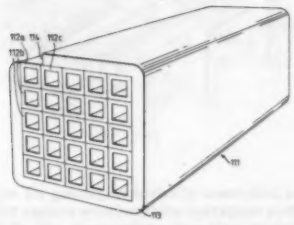
Cyril F. Drake, Harlow, and John R. Brocklehurst, Bishop's Stortford, both of England, assignors to ITT Industries, Inc., New York, N.Y.

Filed Jun. 10, 1981, Ser. No. 272,144

Claims priority, application United Kingdom, Jun. 12, 1980, 8019261; Dec. 10, 1980, 8039566

Int. Cl.³ A61K *9/26*

U.S. Cl. 604—890 **13 Claims**



1. A device for the controlled release of an active material into a liquid medium over a predetermined period, characterised in that the device comprises a body formed of one or more water soluble glass materials surrounded by a casing of material having a relatively low or zero disslution rate, said body having a plurality of capillary cavities for containing the active material, said casing having an access port or a region that readily dissolves to provide an access port, whereby a portion of the body is exposable to dissolving action by the liquid, the body being so constructed that it is dissolved by the liquid to release in a sequential manner the active material contained in the capillary cavities.

4,449,982

PROJECTILE

Jay W. Gould, III, Bloomington, Minn., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

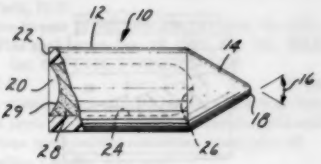
Continuation of Ser. No. 740,663, Nov. 10, 1976, abandoned. This application Nov. 30, 1978, Ser. No. 965,102

Int. Cl.³ A61M *5/00*

U.S. Cl. 604—891 **2 Claims**

1. A method of implanting a medicament or device in the flesh of an animal comprising the steps of:

combining the medicament or device in a projectile having an average density of no greater than 5 grams per cubic centimeter, an elongated body portion with a diameter between 0.177 and 0.30 inch and a central axis, and a generally conical nose portion coaxial with and projecting from one end of said body portion, said nose portion having a base corresponding generally in cross sectional area with the adjacent cross sectional area of said body portion, an apex angle of greater than 45 degrees and up to 75 degrees, and having a 0.015 to 0.02 inch radius on its apex; and



propelling the projectile nose portion first at sub-sonic speeds through the hide and into the flesh of the animal so that the nose portion causes only a slit in the hide of the animal where the projectile enters which slit is shorter in length than the diameter of the projectile, and the projectile will make limited penetration of the flesh of the animal with limited damage thereto.

4,449,983

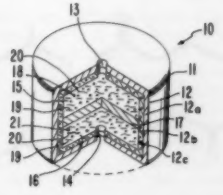
SIMULTANEOUS DELIVERY OF TWO DRUGS FROM UNIT DELIVERY DEVICE

Richard Cortese, San Jose; Brian Barclay, Menlo Park, and Felix Theeuwes, Los Altos, all of Calif., assignors to ALZA Corporation, Palo Alto, Calif.

Filed Mar. 22, 1982, Ser. No. 360,589

Int. Cl.³ A61M *31/00*

U.S. Cl. 604—892 **18 Claims**



1. An osmotic therapeutic device for the controlled delivery of beneficial drugs to a biological environment, the device consisting essentially of:

(a) a wall formed of a semipermeable material permeable to the passage of an external fluid present in the environment and substantially impermeable to the passage of drug, the semipermeable wall surrounding and forming;

(b) a first compartment containing a drug formulation that exhibits an osmotic pressure gradient across the semipermeable wall against an external fluid;

(c) a second compartment containing a drug formulation that exhibits an osmotic pressure gradient across the semipermeable wall against an external fluid;

(d) a partition positioned between the first and second compartments, which partition is formed of a hydrogel that expands in the presence of fluid;

(e) a first orifice in the wall communicating with the first compartment and the exterior of the device for delivering drug formulation from the first compartment to the environment over a prolonged period of time; and,

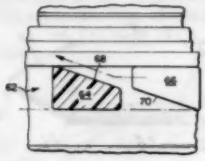
(f) a second orifice in the wall communicating with the second compartment and the exterior of the device for delivering drug formulation from the second compartment to the environment over a prolonged period of time.

4,449,984

CONTAINER HAVING AN AIR TIGHT SEAL

Exequiel D. Cruz, Palatine, Ill., assignor to Respiratory Care, Inc., Arlington Heights, Ill.

Filed Jun. 24, 1982, Ser. No. 391,914
Int. Cl.[3] A61F 5/44; B65D 25/14
U.S. Cl. 604—319 9 Claims



1. A medical suction container comprising:
a canister;
a liner mounted within said canister having an open end and formed of a flexible material;
a lid for said canister having a vacuum conduit port which is adapted to be attached to a suction line to create a vacuum within said liner, and a patient conduit port for receiving fluid from a patient during a medical suction procedure;
a sealing means comprising a liner sealing assembly for providing a seal between said liner and said lid, and a canister sealing assembly for providing a seal between said canister and said liner;
said liner sealing assembly comprises a sealing protrusion on said lid and a first upwardly extending liner portion and a second upwardly extending liner portion between which is formed a liner notch at the open end of said liner;
said canister sealing assembly is disposed below said liner sealing assembly and comprises a first upwardly extending canister portion and a second upwardly extending canister portion between which is formed a canister notch; and
a forcing means for forcing said sealing protrusion into said liner notch and extending said flexible material of said liner into said canister notch thereby forming a seal between said lid and said liner, and said liner and said canister.

4,449,985

DYE COMPOSITIONS CONTAINING PARTIALLY HYDROLYZED POLYVINYL ESTER

Joseph R. Ditzer, Jr., Kingsport, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 304,772, Sep. 23, 1981, abandoned. This application Jun. 28, 1982, Ser. No. 392,483

Int. Cl.³ D06P *67/00*

U.S. Cl. 8—528 8 Claims

1. A composition for use in preparing thickened thermosol dye baths or print paste, comprising an aqueous system of from about 5% to about 30% by weight of a substantially water insoluble disperse dye component and from about 2% to about 12% by weight of polyvinyl alcohol comprised of hydrolyzed polyvinyl ester.

4,449,986

MACHINE FOR GUIDING NUMERICALLY CONTROLLED SUPPORTS FOR TOOLS USED IN WOODWORKING OPERATION

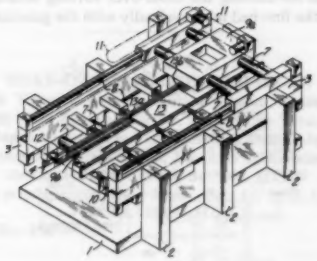
Kurt Held, Alte Strasse 1,, D-7218 Trossingen 2, Fed. Rep. of Germany

Filed May 14, 1981, Ser. No. 263,566

Claims priority, application Fed. Rep. of Germany, May 16, 1980, 3018760; Dec. 12, 1980, 3046766

Int. Cl.³ B23B *39/00*

U.S. Cl. 29—26 A 3 Claims



1. Machine for guiding numerically controlled supports for tools used for various woodworking operations such as boring, milling and the like, comprising a base plate having two pairs of opposite sides with one pair of sides extending in a first direction and the other pair of sides extending in a second direction substantially perpendicular to the first direction, frame supports connected to and extending upwardly from said base plate transversely of the first and second directions, guidance supports mounted on said frame supports and extending in the first direction transversely of the upward direction of said frame supports, means located on said guidance supports for conveying at least one workpiece to be processed, said means comprising conveyor members extending in the first direction, an upper tool support located above said conveyor members and a lower tool support located below said conveyor members, means for movably supporting said upper and lower tool supports from said guidance supports so that said first and second tool supports can be moved relative to the workpiece in the first and second directions, at least one first gripping member on said upper tool support and at least one second gripping member on said lower tool support, said first and second gripping members being movable with said upper and lower tool supports, a third stationary gripping member at each of the opposite ends of said guidance supports spaced apart in the first direction whereby using said first, second and third gripping members the speed of movement of the workpiece being processed can be synchronized with the processing time for the workpiece and an edge of the workpiece extending transversely of the first direction can be utilized as a reference edge such as by photo-optically checking the location of the edge for effecting the location of the processing operations of the workpiece, and for operating said gripping members in accordance with the processing operations being performed.

4,449,987

FRAGRANT INSECT REPELLENT COMPOSITION AND COMBUSTIBLE CANDLE COMPOSITION CONTAINING SAME

Jerome I. Lindauer, Hillsdale, N.J., assignor to Avon Products, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 316,150, Oct. 29, 1981, abandoned. This application Jun. 18, 1983, Ser. No. 458,891

Int. Cl.³ C11C *5/00*; C10L *5/00*

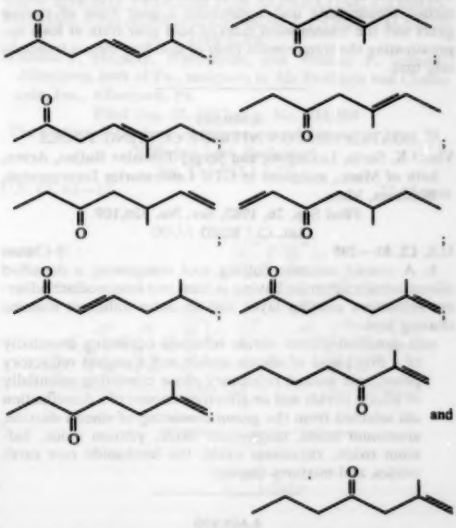
U.S. Cl. 44—7.5 10 Claims

1. A candle comprising a molded hydrocarbon wax composition having a protruded wick embedded therein, said molded hydrocarbon wax composition consisting essentially of:

(a) A crystalline paraffin wax; and

(b) A perfuming and insect repelling quantity of a composition of matter consisting essentially of:

(i) From 1 up to 30 parts by weight of at least one methyl heptenone having a structure selected from the group consisting of:



and

(ii) From 1 up to 10 parts by weight of coumarin; and

(iii) From 1 up to 15 parts by weight of indole.

4,449,988

MACHINE TOOL FEED SCREW DRIVE

Werner Redeker, Börnsen, and Uwe Uhlig, Buchholz, both of Fed. Rep. of Germany, assignors to Hauni-Werke Körber & Co. KG., Hamburg, Fed. Rep. of Germany

Filed Jan. 29, 1982, Ser. No. 343,739

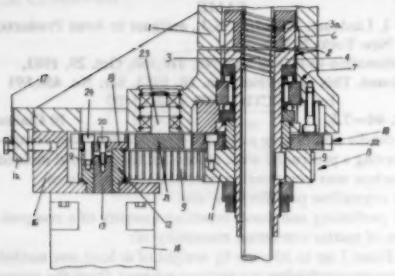
Claims priority, application Fed. Rep. of Germany, Feb. 20, 1981, 3106238

Int. Cl.³ B24B *47/02*

U.S. Cl. 51—165.8 10 Claims

1. In a machine tool, particularly in a surface grinding machine, the combination of a displacing unit including a first component constituting an upright feed screw and a second component constituting a nut coaxial to and meshing with said feed screw, one of said components being rotatable relative to the other of said components to thereby move one of said components axially; prime mover means; a first torque trans-

mitting unit interposed between said prime mover means and said rotatable component to normally rotate said rotatable component, said first torque transmitting unit comprising an endless toothed belt; and a second torque transmitting unit interposed between said prime mover means and said rotatable



component to prevent uncontrolled rotation of said rotatable component in the event of breakage of said belt, said second torque transmitting unit comprising a gear train of mating gears and the transmission ratio of said gear train at least approximating the transmission ratio of said first torque transmitting unit.

4,449,989

COATED SILICON NITRIDE CUTTING TOOLS

Vinod K. Sarin, Lexington, and Sergej-Tomislav Buljan, Acton, both of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed Sep. 26, 1983, Ser. No. 536,109
Int. Cl.³ B24D *11/00*
U.S. Cl. 51—295 **9 Claims**

1. A coated ceramic cutting tool comprising a densified silicon nitride substrate having at least one intermediate adherent refractory coating layer and an outer adherent alumina coating layer:

said densified silicon nitride substrate consisting essentially of a first phase of silicon nitride and a second refractory phase, said second refractory phase consisting essentially of silicon nitride and an effective amount of a densification aid selected from the group consisting of silicon dioxide, aluminum oxide, magnesium oxide, yttrium oxide, hafnium oxide, zirconium oxide, the lanthanide rare earth oxides, and mixtures thereof.

4,449,990

METHOD AND APPARATUS FOR FRACTIONING OXYGEN

Richard A. Tedford, Jr., Middletown, Conn., assignor to Invacare Respiratory Corp., Elyria, Ohio

Filed Sep. 10, 1982, Ser. No. 416,578
Int. Cl.³ B01D *53/04*
U.S. Cl. 55—26 **18 Claims**

1. A method of fractionating components of a gaseous mixture in which each cycle has a preselected cycle duration, the method comprising cyclically repeating the steps of:

supplying the gaseous mixture to one of first and second beds which each contain a physical separation medium which selectively adsorbs at least one adsorbable component and passes at least one substantially nonadsorbable component of the gaseous mixture, collecting the nonadsorbable component passed by the gaseous mixture supplied bed, and evacuating the other of the first and second beds;

before reaching the capacity of the gaseous mixture supplied bed to adsorb the adsorbable component and while continuing the steps of supplying the gaseous mixture to and evacuating the beds, allowing gas to flow between the beds at a rate which would bring the beds into pressure equilibrium in less than 7 percent of said cycle duration to bring the beds toward pressure equilibrium;

substantially ¼ percent to 4 percent of the cycle duration after commencement of the equalizing step, before the pressure equalizing gas flow commences being evacuated from the evacuated bed, and while continuing the pressure equalizing gas flow between the beds, reversing the supply of gaseous mixture to and the evacuation of the beds; and,

subsequent to reversing the beds, terminating the pressure equalizing gas flow and collecting the nonadsorbable component.

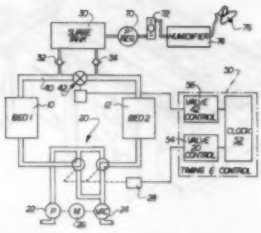
17. An apparatus for physically separating molecules of oxygen from a nitrogen, water vapor, and oxygen containing gaseous mixture, the apparatus comprising:

(a) a first bed of a physical separation material which is traversed by oxygen molecules and which adsorbs at least nitrogen and water vapor molecules from the gaseous mixture, the first bed having an inlet and an outlet;

(b) a second bed of said physical separation material, the second bed having an inlet and an outlet;

(c) a cross-over valving means for selectively connecting the inlet and one of the first and second beds with a supply of the gaseous mixture under pressure and the inlet of the other bed with a vacuum source;

(d) a timing and control means including a first valve control means for causing the cross-over valving means to connect the first bed inlet cyclically with the gaseous mixture



supply and the vacuum source and the second bed inlet cyclically with the vacuum source and the gaseous mixture supply, such that the cross-over valving means is actuated twice during each cycle;

(e) a flow path connecting the first bed outlet and second bed outlet, the flow path having a gas flow capacity such that the flow path is sufficient to being the first and second beds substantially into pressure equilibrium in less than 7 percent of the duration of the cycle;

(f) a pressure equalization valve for selectively permitting and preventing gas flow through the flow path, the pressure equalization valve being operatively connected with the timing and control means, said timing and control means further including pressure equalization valve controlling means for causing the pressure equalization valve to commence permitting gas flow more than ¼ and less than 2 percent of said cycle duration before the cross-over valving means is actuated and causing the pressure equalization valve to commence preventing gas flow more than ¼ and less than 3 percent of said cycle duration after actuation of the cross-over valving means;

(g) a surge tank operatively connected with the first bed outlet and second bed outlet by undirectional valving means to receiving oxygen molecules from the first and second beds; and,

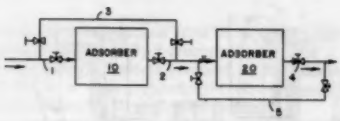
(h) humidifier means operatively connected with the surge tank for adding water vapor to the oxygen rich gas therein.

4,449,991

REMOVAL OF SULFUR FROM PROCESS STREAMS

Judeth H. Brannon, and James J. Schorfheide, both of Baton Rouge, La., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Dec. 20, 1982, Ser. No. 451,102
Int. Cl.³ B01D 53/04
U.S. Cl. 55—73 9 Claims



1. In a process for the removal of sulfur from a sulfur-containing process-stream wherein said sulfur-containing process stream is passed through a fixed bed of sorbent, sulfur removed on said sorbent, and passage of said sulfur-containing process stream through said fixed bed of sorbent continued until breakthrough of sulfur from the exit side of said fixed bed of sorbent the improvement comprising

discontinuing, and reversing without desorption of the sulfur from the sorbent the direction of flow of the sulfur-containing process stream through said fixed-bed of sorbent, and further removing sulfur on said sorbent until breakthrough of sulfur from the former entry side of the sorbent.

4,449,992

HEAT-AND-MOISTURE EXCHANGER

Takeyoshi Yamada; Shizuka Kurisu; Shizuo Azuma, all of Iwakuni; Shoji Kawase, Koganei, and Makoto Sano, Iwakuni, all of Japan, assignors to Teijin Limited, Osaka, Japan

Continuation of Ser. No. 54,405, Jul. 3, 1979, abandoned. This application Jan. 5, 1981, Ser. No. 222,548
Claims priority, application Japan, Dec. 14, 1978, 53-153722
Int. Cl.³ B01D 53/22
U.S. Cl. 55—158 8 Claims

1. A heat-and-moisture exchanger comprising a thin film-like porous material as a stationary partitioning element for heat and moisture exchanges between two gases separated by said porous material, said porous material containing numerous pores having an average diameter of not more than 5 microns and opened to both surfaces thereof, and having a thickness of not more than 500 microns, a specific surface area of at least 0.3 m^2/g, and a gas permeability having a value of at least 100 seconds/100 cc.

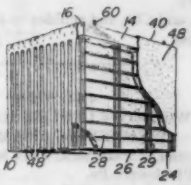
4,449,993

FILTER MODULE FOR DUST COLLECTOR SYSTEM

Willard Bergeron, Drummondville, Canada, assignor to Equifab, Inc., Beloeil, Canada

Filed Jul. 19, 1982, Ser. No. 399,496
Int. Cl.³ B01D 46/02
U.S. Cl. 55—379 8 Claims

1. A filter module comprising a frame, a plurality of spaced-apart arch members supported therefrom to bridge over a one side thereof, a one-piece filter bag having a mouth portion generally circumscribing said frame and a plurality of pockets opening into the mouth, each said pocket enveloping a respective one of said arch members, said frame comprising two



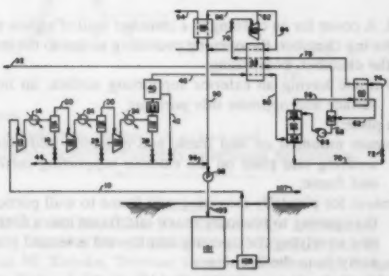
opposing sides and, on each side thereof, a first, fixed member and a second movable member spaced therefrom, and means for urging said movable member towards said fixed member to clamp the legs of said arch members therebetween.

4,449,994

LOW ENERGY PROCESS FOR SEPARATING CARBON DIOXIDE AND ACID GASES FROM A CARBONACEOUS OFF-GAS

William P. Hegarty, Wescosville, and William P. Schmidt, Allentown, both of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Jan. 15, 1982, Ser. No. 339,359
The portion of the term of this patent subsequent to Nov. 29, 2000, has been disclaimed.
Int. Cl.³ F25J 3/00
U.S. Cl. 62—17 23 Claims



1. A process for separating a carbonaceous off-gas containing acid gases, such as: carbon dioxide, hydrogen sulfide and carbonyl sulfide by separating said off-gas into an essentially sulfur-free fuel gas and a sulfur containing acid gas stream, comprising the steps of:

(a) compressing and after cooling an off-gas from an off-gas producing operation;

(b) removing any butane and higher boiling hydrocarbons from the off-gas of step (a) by absorption in lean solvent and drying the compressed and cooled off-gas to remove moisture from said gas;

(c) cooling the off-gas from step (b) against product gas streams in a heat exchanger;

(d) separating the cooled off-gas in a rectifying column without the use of an external solvent into an initial sulfur-free fuel gas stream as an overhead fraction and a carbon dioxide and sulfide stream as a bottom liquid fraction;

(e) expanding the initial carbon dioxide and sulfide stream in order to cool by autorefrigeration the initial fuel stream in a heat exchanger;

(f) separating said cooled fuel stream into a final sulfur-free

fuel stream and a sulfur-free reflux stream that is reintroduced into the head of the rectifying column;

(g) further expanding the carbon dioxide and sulfide stream in an autorefrigeration cycle to provide additional refrigeration for the cooling of the off-gas in the heat exchanger of step (c);

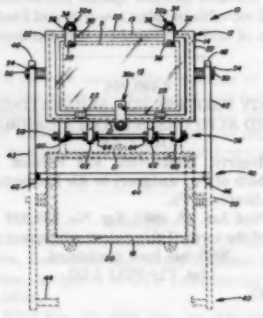
(h) sending said CO_2 and sulfides to a carbon dioxide utilizing process.

4,449,995

HINGED WINDOW CLOSURE FOR FLOAT GLASS PROCESSING CHAMBER

Harold M. Koelbl, Burkburnett, Tex., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jul. 22, 1982, Ser. No. 400,808
Int. Cl.³ C03B 5/16
U.S. Cl. 65—158 **6 Claims**



1. A cover for an opening in a chamber wall of a glass manufacturing chamber, the opening providing access to the interior of the chamber, comprising:

a frame having an exterior supporting surface, an interior surface and opposite side portions;

a plate;

means mounted on said frame and engaging said plate for securing said plate on the exterior supporting surface of said frame;

means for pivotally mounting said frame to wall portions of the opening to pivotally move said frame into a first position overlying the opening and toward a second position away from the opening;

a handle having a pair of spaced longitudinal members each having a first end portion and an opposite second end portion and a transverse member interconnecting the first end portion of each of said longitudinal members;

means between end portions of each of said longitudinal members for pivotally mounting a one of said pair of longitudinal members to each of said side portions of said frame; and

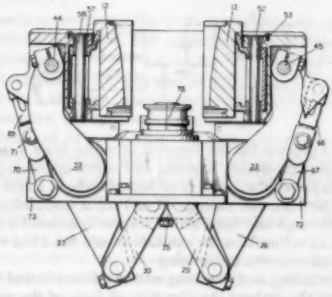
latching means for biasing said frame toward the opening, said latching means including a first element mounted on exterior wall portions of the opening or the chamber wall and a second element mounted on the second end portion of each of said longitudinal members of said handle such that said second element of said latching means engages said first element of said latching means when said frame overlies the opening and said first and said second elements of said latching means cooperate with one another to (1) bias said frame toward the opening when said handle is pivoted into a locking position such that the transverse member of said handle does not overlie said plate and (2) release said frame from the opening when said handle is pivoted away from the locking position.

4,449,996

PARALLEL MOTION BLANK MOLD OPERATING MECHANISM

George W. Irwin, Holland, Ohio, and Eustace H. Mumford, Ottawa Lake, Mich., assignors to Owens-Illinois, Inc., Toledo, Ohio

Filed Dec. 22, 1982, Ser. No. 452,174
Int. Cl.³ C03B 9/34
U.S. Cl. 65—305 **10 Claims**



1. Apparatus for opening and closing a plurality of parison molds simultaneously in a confined space comprising a base, a pair of horizontal, parallel drive shafts supported in bearings above said base, a pair of crank arms formed at one end of each drive shaft, a pair of opposed mold holder carriers positioned above said base and each adapted to hold at least one mold half, a horizontal pivot pin adjacent the upper portion of each mold holder, means connecting the other end of said crank arms to said first pivot pins for supporting the mold holder carriers above the base, a second pair of arms pivotally connected between the base and the mold hold carrier, said second arms being generally parallel to said crank arms to thereby serve as parallel connections between the base and each mold holder carriers, a plurality of neck molds extending up from the base into position between the parison mold halves, drive means connected to said drive shafts for simultaneously rotating said drive shafts each in opposite directions, said drive means moving said mold holder carriers toward each other until the mold halves carried thereby are in abutting relationship and in engagement with the neck molds, with the centers of rotation of the drive shafts and the pivot pins being in a plane that is at an angle with respect to a vertical plane defined by the parting line of the mold halves, with the axes of the pivot pins being closer to the vertical plane than the axes of the drive shafts.

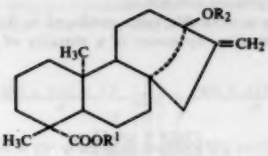
4,449,997

PLANT GROWTH REGULATOR

Junichi Iwamura, 621-1, Ooazatakaida, Kashiwara, Osaka, and Koichiro Komai, 38, Yakushiyamahigashi-cho, Oomiya, Kita-ku, Kyoto, both of Japan, assignors to Junichi Iwamura; Gakko Hojin Kinki Daigaku (Educational Foundation Kinki Univ.), both of Osaka and Koichiro Komai, Kyoto, all of, Japan

Filed Oct. 6, 1981, Ser. No. 308,970
Claims priority, application Japan, Apr. 2, 1981, 56-50194
Int. Cl.³ A01N 43/16
U.S. Cl. 71—88 **6 Claims**

1. A method for promoting the growth of a plant which comprises applying to the plant an effective amount of at least one diterpene glucoside of the formula:


(I)

wherein R^1 is a hydrogen atom or any other cation and R^2 is β-glucopyranosyl-(1-2)-β-glucopyranosyl or 2,3-di-O-)β-glucopyranosyl- β-glucopyranosyl, or R^1 is β-glucopyranosyl and R^2 is α rhamnopyranosyl-(1-2) -β-glucopyranosyl, β-glucopyranosyl-(1-2)-β-glucopyranosyl, 2,3-di-O-(β-glucopyranosyl)-β-glucopyranosyl or (3-Oβ-glucopyranosyl)-(2-O-α-rhamnosyl-β-glucopyranosyl).

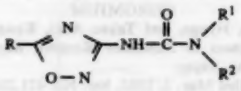
4,449,998

HERBICIDALLY ACTIVE OXADIAZOLE UREAS

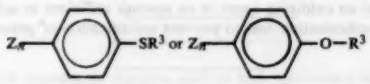
Jerome M. Lavanish, Akron, and Barry Van Gemert, Massillon, both of Ohio, assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed May 20, 1982, Ser. No. 380,191
Int. Cl.³ C07D *271/06;* A01N *43/82*
U.S. Cl. 71—92 **6 Claims**

1. A compound represented by the formula:



wherein R is alkyl of up to 6 carbon atoms; cycloalkyl of from 3 to 8 carbon atoms; alkenyl or alkynyl of up to 5 carbon atoms; $—R^3—O—R^4$ or $R^3—S—R^4$ wherein R^3 is alkylene of up to 6 carbon atoms and R^4 is alkyl of up to 6 carbon atoms; or



wherein:

Z is nitro, halogen, trifluoromethyl or R^4, and n is 0, 1, 2, or 3; and

R^1 and R^2 are hydrogen or the same or different alkyl or alkoxy of up to 6 carbon atoms, provided that only one of R^1 or R^2 may be hydrogen.

5. A herbicidal composition containing an agronomically acceptable carrier and a herbicidally effective amount of a compound or mixture of compounds defined in claim 1.

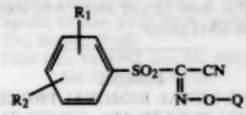
4,449,999

SULFUR-CONTAINING OXIME COMPOUNDS, PROCESSES FOR PRODUCING THEM, AND THEIR USE FOR PROTECTING CULTIVATED PLANTS

Elmar Sturm, Aesch; Heinrich Schempp, Arlesheim, and Henry Martin, Allschwil, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 68,123, Aug. 20, 1979, Pat. No. 4,278,613. This application May 4, 1981, Ser. No. 260,648
Claims priority, application Switzerland, Aug. 28, 1978, 9081/78
Int. Cl.³ A01N *25/32*
U.S. Cl. 71—73 **71 Claims**

1. A composition for protecting cereal plants against the action of a herbicide selected from the group consisting of herbicidal 1,3,5-triazines, halogenoacetanilides, substituted phenoxyphenoxyacetic acid esters and -propionic acid esters, and substituted pyridineoxy-phenoxy-acetic acid esters and -propionic acid esters derivatives, which comprises a compound of the formula:



wherein each of R_1 and R_2, independently of the other, is hydrogen, halo or alkyl of 1 to 4 carbon atoms, and Q is —CH_2CONH_2 or —CONH—alkyl in which alkyl has from 1 to 4 carbon atoms, in an amount sufficient to afford protection to the cereal plant against the herbicidal effects of said herbicide and a carrier therefor.

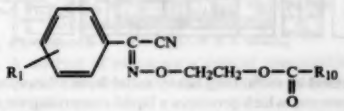
4,450,000

OXIME DERIVATIVES FOR PROTECTING PLANT CROPS

Werner Föry, Basel; Henry Martin, Allschwil, both of Switzerland, and Georg Pissiotas, Lörrach, Fed. Rep. of Germany, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 68,263, Aug. 20, 1979, Pat. No. 4,353,735. This application Jul. 14, 1982, Ser. No. 398,172
Claims priority, application Switzerland, Aug. 31, 1978, 9201/78
Int. Cl.³ A01N *37/34;* C07C *121/52*
U.S. Cl. 71—105 **5 Claims**

1. A compound of the formula



wherein

R_1 is hydrogen, halogen or cyano, and

R_{10} is lower alkyl optionally substituted by halogen.

4,450,001

ANIONIC BIOCIDE EMULSIONS IN AQUEOUS SOLUTIONS OF STRONGLY IONIZABLE SALTS

Thomas M. Kaneko, Trenton; Daniel R. Dutton, and Bongsub Kim, both of Grosse Ile, all of Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Feb. 19, 1980, Ser. No. 122,209
Int. Cl.³ A01N *37/18, 33/02*
U.S. Cl. 71—118 **14 Claims**

1. An emulsifiable concentrate adapted for use in forming aqueous emulsions suitable for spray application comprising about 90 to 99 percent by weight of at least one liquid biocide and about 1 to about 10 percent by weight of at least one polyoxyalkylene ester surfactant said ester being the reaction product of a polybasic acid or anhydride with a polyoxyalkylene glycol ethoxylate having the formula

$$Y[(A)_n(C_2H_4O)_m H]_x$$

wherein A is an alkylene oxide having 4 carbon atoms and selected from the group consisting of oxybutylene, the residue of tetrahydrofuran, and mixtures thereof; Y is an initiator having up to 20 carbon atoms and free of elements other than carbon, hydrogen, oxygen and nitrogen and x is an integer of at least 2, n is an integer such that the molecular weight is about 1000 to about 2500, m is an integer such that the oxyethylene content of the entire compound, mx oxyethylene groups,

constitutes about 20 to about 80 percent by weight of the total oxyalkylene content or

the surfactant blend comprising said polyoxyalkylene ester surfactant and at least one other anionic, alkyl aromatic sulfur- or phosphorus-containing ester surfactant having an HLB of at least 15 and about 9 to about 18 carbon atoms in the alkyl group.

4,450,002

HEAVY METAL REMOVAL PROCESS

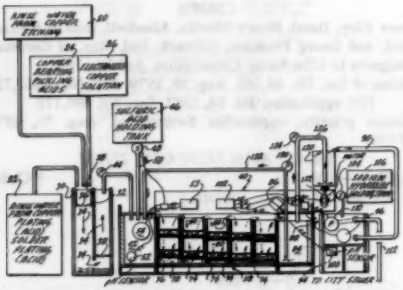
Richard G. Durkee, 16780 Tin Mountain Cir., Foutain Valley, Calif. 90212

Continuation-in-part of Ser. No. 115,039, Jan. 24, 1980, Pat. No. 4,294,434, which is a continuation-in-part of Ser. No. 173,321, Jul. 29, 1980, Pat. No. 4,304,599. This application Oct. 13, 1981, Ser. No. 310,989

The portion of the term of this patent subsequent to Oct. 13, 1998, has been disclaimed.

Int. Cl.³ C22B *15/12*

U.S. Cl. 75—0.5 A **4 Claims**



1. A method of reclaiming heavy metal from a heavy metal finishing process, which produces a liquid comprising an aqueous solution of the heavy metal, comprising the steps of:

a. establishing the aqueous solution to a pH less than 3.3 to establish in said solution heavy metal in ionic form;

b. flowing at a rate at least faster than that rate generated by gravity the aqueous solution containing the heavy metal in a path including a supply of substantially pure aluminum metal, the aluminum having a relative electrode potential greater than that of the reclaimed heavy metal in the aqueous solution to precipitate the heavy metal and replace it with ionic aluminum in the aqueous solution; and,

c. mechanically separating the heavy metal in metallic form from said aqueous solution while maintaining the aqueous solution substantially free of clouds formed by aluminum salts resulting from said ionic aluminum.

4,450,003

PROCESS AND APPARATUS FOR THE RECOVERY OF COMBUSTIBLE GASES IN AN ELECTROMETALLURGY FURNACE

Robert Herold, and Francis Dubrous, both of Sallanches, France, assignors to Societe Francaise d'Electrometallurgie Sofrem, Paris, France

Filed Nov. 1, 1982, Ser. No. 438,262

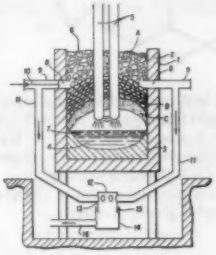
Claims priority, application France, Dec. 1, 1981, 81 22881

Int. Cl.³ C21B *7/22*; C21C *5/38, 5/40*

U.S. Cl. 75—10 R **10 Claims**

1. A process for the recovery of combustible gases in an electrometallurgical furnace, said furnace comprising an external metal casing and an internal refractory lining, in which at least one oxidized compound is reduced by means of carbon, the different components being introduced into the furnace in the form of a particulate charge which progressively moves downward towards a reaction region, passing through a sintering region, said process comprising:

collecting the combustible gases produced in the reaction region by suction, by means of a plurality of apertures



provided in the external metal casing and internal refractory lining and disposed at a level corresponding to the level of the charge immediately above said sintering region.

4,450,004

DEPHOSPHORIZATION AND DESULFURIZATION METHOD FOR MOLTEN IRON ALLOY CONTAINING CHROMIUM

Tohru Matsuo, Hyogo, and Takeo Aoki, Kawanishi, both of Japan, assignors to Sumitomo Kinzoku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Mar. 2, 1983, Ser. No. 471,238

Claims priority, application Japan, Mar. 3, 1982, 57-33549

Int. Cl.³ C21C *7/02*

U.S. Cl. 75—53 **10 Claims**

1. A method of dephosphorizing and desulfurizing a molten iron alloy containing chromium, comprising adding to the molten iron alloy (a) a flux comprised of at least one alkaline-earth metal oxide and at least one alkaline-earth metal halide and (b) an oxidizing agent in an amount sufficient to achieve dephosphorization and to prevent solidification of generated slag.

4,450,005

METAL REFINING METHOD

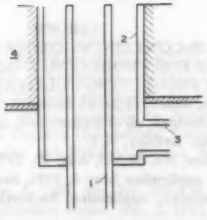
Yasuyuki Nakao; Yosuke Hoshijima, both of Himejishi, and Kazuo Okohira, Kitakyusyushi, all of Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Feb. 4, 1982, Ser. No. 345,917

Claims priority, application Japan, Oct. 26, 1981, 56-170198

Int. Cl.³ C21C *5/34*

U.S. Cl. 75—60 **5 Claims**



1. In a method of refining a metal by blowing a refining gas surrounded by a cooling gas into the melt of the metal to be refined using a concentric multi-tube system nozzle situated beneath the surface of the melt in a refining vessel, the im-

proved metal refining method which comprises controlling the flow rate of the cooling gas passing through the passageway for the cooling gas formed between the outermost tube and the adjacent inner tube of the nozzle as defined by the following equation:

$$\frac{600 \times \pi Di \times \Delta T}{A} \leq B \leq \frac{1400 \times \pi Di \times \Delta T}{A}$$

wherein A is the cooling capacity of the cooling gas; B is the flow rate of the cooling gas; πDi is the inside circumference of the outermost tube; and T is the wall thickness of the outermost tube.

4,450,006

MARTENSITIC STAINLESS STEEL

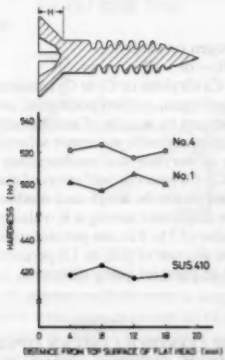
Norioki Uyehara, 26-1 Mashida-Kitamachi, Inazawa, Aichi-ken; Susumu Abe, 4-21 Kanazawa-Higashitora, Chita, Aichi-ken, and Yasuhiro Kimura, 12-29 Shirasawa-Kitaishine, Agui, Aichi-ken, all of Japan

Filed Oct. 21, 1981, Ser. No. 313,671

Claims priority, application Japan, Oct. 22, 1980, 55-147791

Int. Cl.³ C22C *38/16*

U.S. Cl. 75—125 **5 Claims**



1. A martensitic stainless steel of high mechanical strength and suitable for processing by cold pressing, which steel consist of 0.20 to 0.50% of C, 0.01 to 0.50% of Si, 0.30 to 2.0% of Mn, 1.0 to 3.0% of Cu, up to 0.20% of Ni, 13.0 to 17.0% of Cr and 0.02 to 0.10% of N, and the balance being Fe and inevitable impurities.

4,450,007

PROCESS FOR ELECTROSLAG REMELTING OF MANGANESE-BASE ALLOYS

Robert B. Herchenroeder, Kokomo, and Boyd A. Heath, Tipton, both of Ind., assignors to Cabot Corporation, Kokomo, Ind.

Filed Dec. 13, 1982, Ser. No. 449,323

Int. Cl.³ C22B *4/06*

U.S. Cl. 75—10 C **10 Claims**

1. In a process for refining a metal by partially immersing a consumable electrode of said metal in a layer of molten slag and passing current between said consumable electrode and a second electrode through said slag layer under conditions which gradually melt said consumable electrode so that drops of molten metal from said consumable electrode move downwardly through said slag layer and resolidify as an ingot thereunder, the improvement comprising the steps of immersing a consumable electrode of a manganese-base alloy in a slag characterized by a liquidus temperature of more than 300° F. (149° C.) above the melting point of said consumable electrode and passing current between said consumable electrode and said second electrode through said slag, said slag being comprised of Al_2O_3, CaO and CaF_2.

4,450,008

STAINLESS STEEL

Rockne J. Andreini, Redmond; Audley J. Farmer, Kent, and Svetlana Yaguchi, Renton, all of Wash., assignors to Earle M. Jorgensen Co., Seattle, Wash.

Filed Dec. 14, 1982, Ser. No. 449,608

Int. Cl.³ C22C *38/04*

U.S. Cl. 75—128 A **5 Claims**

1. A fully austenitic, substantially nonmagnetic stainless steel, consisting essentially of, by weight:

16–20% Manganese,
12–15% Chromium,
5.0% Molybdenum max.,
2.5% Nickel max.,
1.0% Copper max.,
0.75% Silicon max.,
0.2–0.5% Nitrogen,
0.04% Phosphorus max.,
0.01% Sulfur max.,
0.035% Carbon max.,
Columbium at a concentration of at least ten times the Carbon concentration, and
the remainder being essentially Iron with incidental impurities.

4,450,009

METHOD OF PREPARING A LIGHT WEIGHT CEMENT COMPOSITION FROM SEA WATER

Jerry D. Childs, Duncan; Lance E. Brothers, Lawton, and Mary J. Taylor, Sterling, all of Okla., assignors to Halliburton Company, Duncan, Okla.

Filed Apr. 29, 1983, Ser. No. 490,088

Int. Cl.³ C04B *7/35*

U.S. Cl. 106—76 **20 Claims**

1. A method of preparing a cement composition having a density of from about 11.0 to about 16.0 pounds per gallon comprising:

(a) adding to sea water a hydroxide compound selected from the group consisting of an alkali metal hydroxide, ammonium hydroxide and mixtures thereof said hydroxide compound being present in the range of about 0.2 percent to about 2.0 percent by weight of sea water;

(b) adding to the mixture of step (a) a silicate compound selected from the group consisting of an aqueous alkali metal silicate, an aqueous ammonium silicate and mixtures thereof; and

(c) adding to the mixture of step (b) a hydraulic cement;

wherein said sea water is present in the range of from about 42 percent to about 190 percent by weight of hydraulic cement and said silicate compound is present in the range of from about 0.40 percent to about 3.40 percent by weight of hydraulic cement.

4,450,010

WELL CEMENTING PROCESS AND GASIFIED CEMENTS USEFUL THEREIN

John F. Burkhalter; Jerry D. Childs, and David L. Sutton, all of Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.

Filed Apr. 29, 1983, Ser. No. 489,909

Int. Cl.³ C04B *7/35, 21/02*

U.S. Cl. 106—87 **20 Claims**

1. A cement composition for cementing an oil or gas well comprising

(a) a hydraulic cement;

(b) water;

(c) a gas generating composition selected from the group consisting of:

I. a nitrogen gas generating material selected from the group

consisting of hydrazine, hydrazine sulfate, carbazide, and mixtures thereof;

an oxidizing agent selected from the group consisting of hydrogen peroxide, sodium peroxyborate tetrahydrate, sodium peroxyborate monohydrate, potassium dichromate, and mixtures thereof; and

a reaction rate control material selected from the group consisting of sodium sulfate, calcium sulfate hemihydrate, copper sulfate hemihydrate, copper sulfate, calcium hydroxide, and mixtures thereof;

II. a nitrogen gas generating material selected from the group consisting of hydrazine, hydrazine sulfate, carbazide, and mixtures thereof;

an oxidizing agent selected from the group consisting of calcium peroxide, zinc peroxide, and mixtures thereof; and,

a reaction rate control material comprising copper sulfate;

III. a nitrogen gas generating material selected from the group consisting of an ammonium salt of an organic or inorganic acid, hydroxylamine sulfate, carbamide, azodicarbonamide, and mixtures thereof;

an oxidizing agent selected from the group consisting of hydrogen peroxide, sodium peroxyborate tetrahydrate, sodium peroxyborate monohydrate, and mixtures thereof;

a reaction rate control material comprising copper sulfate; and,

IV. a nitrogen gas generating material comprising azodicarbonamide;

an oxidizing agent comprising calcium peroxide; and,

a reaction rate control material comprising copper sulfate; and,

V. mixtures of I, II, III, or IV.

4,450,011

CATIONIC BITUMINOUS EMULSIONS

Peter Schilling, and Hans G. Schreuders, both of Charleston, S.C., assignors to Westvaco Corporation, New York, N.Y.

Filed Sep. 20, 1982, Ser. No. 419,906

Int. Cl.³ C08L 95/00

U.S. Cl. 106—269 **22 Claims**

1. A cationic bituminous emulsion comprising from about 30% to about 80% by weight of bitumen, from about 0.1% to about 10% by weight of an emulsifier selected from the group consisting of reaction products of polyamines reacted with sulfonated carboxylic acids selected from the group consisting of sulfonated tall oil fatty acid and sulfonated oleic acid, and water to make up 100% by weight, the emulsion having a pH in the range of from 2–7.

4,450,012

FLOCCULATION-RESISTANT, MIXED PHASE PIGMENTS HAVING A RUTILE STRUCTURE, PROCESS FOR THEIR PREPARATION, AND THEIR USE

Dieter Messer; Volker Wilhelm; Robert Endres, all of Cologne, and Heinrich Heine, Krefeld, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Sep. 8, 1982, Ser. No. 415,992

Claims priority, application Fed. Rep. of Germany, Sep. 19, 1981, 3137384

Int. Cl.³ C09C 1/36, 1/00

U.S. Cl. 106—300 **9 Claims**

1. Coated rutile mixed phase pigments comprising a mixed phase rutile pigment having a first coating of an oxide or hydrated oxide of a metal selected from tetravalent titanium, zirconium, tin and mixtures thereof, and a final coating of an oxide or hydrated oxide of aluminium.

4,450,013

GRINDING OR DISPERSING AGENTS FOR PIGMENTS

Guenter Hirsch, Mutterstadt, and Gregor Ley, Wattenheim, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jun. 10, 1982, Ser. No. 387,196

Claims priority, application Fed. Rep. of Germany, Jun. 15, 1981, 3123732

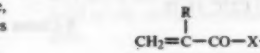
Int. Cl.³ C09C 3/00

U.S. Cl. 106—308 N **4 Claims**

1. A stable, highly concentrated aqueous slurry of an inorganic pigment selected from the group consisting of chalk, clay from primary and secondary deposits, satin white, titanium dioxide, kaolin, and dolomite, said slurry having a viscosity largely unaffected by temperature change between 25° C. and 70° C.; wherein the slurry is stabilized by a dispersant which is a copolymer of:

(a) 40 to 90 percent by weight of an ethylenically unsaturated aliphatic carboxylic acid selected from the group consisting of acrylic and methacrylic acids,

(b) 10 to 60 percent by weight of a compound having the formula:



where

R is hydrogen or methyl

X is —NH— or —O—

A is C_1 to C_8 alkylene or C_1 to C_3 substituted alkylene, and

Me is hydrogen, sodium potassium, or ammonium; and

(c) 0 to 10 percent by weight of another ethylenically unsaturated copolymerizable monomer selected from the group consisting of acrylate and methacrylate esters of C_1–C_4 alcohols, C_1–C_4 esters or half esters of maleic acid, acryloand methacrylonitrile, acryl- and methacrylamide;

said copolymer dispersant having a K-value of 15 to 50 and an adjusted pH value of 7 to 8 in one percent solution at 20° C. and being used in an amount of 0.05 to 1.0 percent by weight based on the amount of pigment being dispersed.

4,450,014

METHOD OF CONTROLLING AN OPERATION OF A COPY-CUTTING APPARATUS

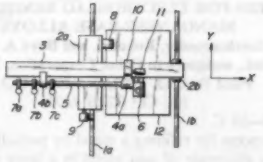
Hidehiko Hayasaki, Ohmiya, and Motoaki Yasumura, Kawagoe, both of Japan, assignors to Kabushiki Kaisha Tanaka Seisakusho, Tokyo, Japan

Filed Jul. 21, 1983, Ser. No. 515,736

Claims priority, application Japan, Jul. 23, 1982, 57-128426

Int. Cl.³ B23K 7/02, 7/10

U.S. Cl. 148—9 R **25 Claims**



1. A method of controlling the operation of a copying apparatus which includes a tracer for tracing automatically a contour of a pattern to be copied and a working machine having a working head movable in conjunction with the tracer in a given relationship for effecting a given working operation for an object to be worked comprises the steps of:

(a) prior to an actual working operation, moving the tracer manually with respect to the pattern to be traced to detect point data representing coordinates of the tracer at respec-

tive operational points which include at least a working start point, a copy start point, and a copy end point;

(b) storing the point data thus detected in memory means;

(c) moving automatically the tracer by reading the stored point data from the memory means until the tracer reaches the copy start point, and when the tracer has reached the copy start point, the tracer is moved automatically along the pattern to detect pattern data representing coordinates of the tracer on the pattern;

(d) storing the pattern data thus detected in the memory means; and

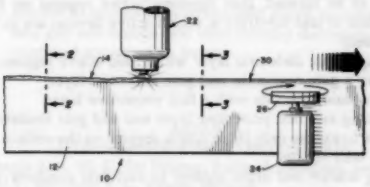
(e) controlling the movement of the tracer under the point data and pattern data read out of the memory.

4,450,015

APPARATUS AND METHOD FOR PROVIDING A SMOOTH EDGE ON SHEARED METAL

William L. Arter, 1214 Margarita Dr., Fullerton, Calif. 92633, and Byron L. Russell, 24882 Rollingwood Rd., El Toro, Calif. 92630

Filed Aug. 9, 1982, Ser. No. 406,444
Int. Cl.³ B23K 7/00
U.S. Cl. 148—9 R 8 Claims



7. In a method of reducing the sheared edge of a metallic sheet, the steps of: placing said sheet in a supporting fixture; and causing relative translation between an edge of said sheet and a heating element to reduce said edge to a smooth radius.

4,450,016

METHOD OF MANUFACTURING CLADDING TUBES OF A ZIRCONIUM-BASED ALLOY FOR FUEL RODS FOR NUCLEAR REACTORS

Gunnar Vesterlund, Västerås, and Erik T. Anderson, Sandviken, both of Sweden, assignors to Santrade Ltd., Lucerne, Switzerland

Filed Jul. 10, 1981, Ser. No. 282,061
Int. Cl.³ C22F 1/18
U.S. Cl. 148—11.5 F 4 Claims

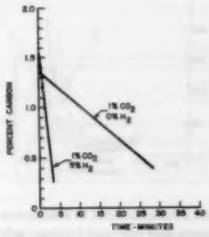
1. In a method of manufacturing cladding tubes of a zirconium-based alloy for fuel rods for nuclear reactors, the zirconium-based alloy containing 1.2 to 1.7 percent by weight tin, 0.07 to 0.24 percent by weight iron, 0.05 to 0.15 percent by weight chromium, 0 to 0.08% nickel and the balance zirconium and ordinary impurities, the zirconium-based alloy being extruded and the extruded product being subjected to cold rollings and at least one annealing, intermediate annealing, between two consecutive cold rollings and a β-quenching prior to the last cold rolling, the improvement wherein the extruded product is β-quenched prior to a cold rolling, after said cold rolling at least one intermediate annealing is performed at a temperature of 500° to 610° C. said intermediate annealing being performed prior to a further cold rolling.

4,450,017

GASEOUS DECARBURIZING MIXTURES OF HYDROGEN, CARBON DIOXIDE AND A CARRIER GAS

Kerry R. Berger, Lehighton, Pa.; Jelle H. Kaspersma, Hazerswoude-Dorp, Netherlands; Joseph R. Luybli, Hellertown, Pa.; Barry Millward, La Place, La., and Robert H. Shay, Kutztown, Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Oct. 21, 1982, Ser. No. 435,834
Int. Cl.³ C21D 1/00
U.S. Cl. 148—16 7 Claims



1. A method of decarburizing thin sheet steel articles comprising the steps of:

charging the articles into a heating furnace maintained at a temperature of between 1200° F. (649° C.) and 1700° F. (927°);

injecting a mixture consisting essentially of from 1 to 20% by volume hydrogen selected from the group consisting essentially of gaseous hydrogen, and hydrogen derived from the decomposition of liquid methanol, 1–50% by weight carbon dioxide balance nitrogen into said furnace whereby a decarburizing atmosphere is created inside said furnace;

holding the articles at temperature and under atmosphere for a period sufficient to produce the desired level of thorough decarburization; and

cooling the articles to room temperature.

4,450,018

FUSED FLUX FOR INCLINED SUBMERGED ARC WELDING

Katsuyuki Suga; Toyofumi Kitada; Yutaka Naganawa, and Hirotaka Nakagawa, all of Yokohama, Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 6, 1983, Ser. No. 482,614
Claims priority, application Japan, Apr. 9, 1982, 57-58020
Int. Cl.³ B23K 35/34; C22B 9/10
U.S. Cl. 148—26 2 Claims

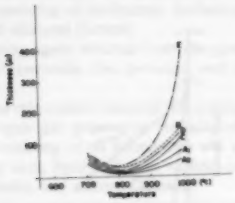
1. Fused flux for inclined submerged arc welding, consisting essentially of Al_2O_3 20 to 30 wt%, SiO_2 15 to 30 wt%, MnO 15 to 30 wt%, TiO_2 10 to 25 wt% and total iron oxide (FeO and Fe_2O_3) not more than 10 wt%.

4,450,019

DUCTILE CAST IRON

Kazuo Satou, Higashihiroshima, and Masashi Yoritaka, Hiroshima, both of Japan, assignors to Toyo Kogyo Co., Ltd., Hiroshima, Japan

Filed Mar. 30, 1983, Ser. No. 480,572
Claims priority, application Japan, Apr. 1, 1982, 57-55053
Int. Cl.³ C22C 37/10
U.S. Cl. 148—35 3 Claims



1. A ductile cast iron excellent in resistance to both oxidation at high temperatures and thermal fatigue, which consists essentially of carbon in an amount of 2.5 to 3.8 wt%, silicon in an amount of 3.5 to 4.8 wt%, manganese in an amount of 1.0 wt% or less, phosphorus in an amount of 0.1 wt% or less, sulfur in an amount of 0.1 wt% or less, molybdenum in an amount of 0.5 to 2.0 wt%, magnesium in an amount of 0.03 to 0.1 wt%, at least one of cerium and lanthanum in an amount of 0.02 to 0.5 wt% and iron in the balance.

4,450,020

METHOD OF MANUFACTURING CLADDING TUBES OF A ZIRCONIUM-BASED ALLOY FOR FUEL RODS FOR NUCLEAR REACTORS

Gunnar Vesterlund, Västeras, Sweden, assignor to Santrade Ltd., Lucerne, Switzerland

Continuation-in-part of Ser. No. 282,061, Jul. 10, 1981. This application Oct. 4, 1982, Ser. No. 432,687
Claims priority, application Sweden, Jul. 1, 1982, 8204072
The portion of the term of this patent subsequent to May 22, 2001, has been disclaimed.
Int. Cl.³ C22F 1/18
U.S. Cl. 148—11.5 F 8 Claims

1. A method of manufacturing cladding tubes of a zirconium-based alloy for fuel rods for nuclear reactors, said zirconium-based alloy containing 1.2–1.7 percent by weight tin, 0.07–0.24 percent by weight iron, 0.05–0.15 percent by weight chromium and 0–0.08 percent by weight nickel, the method comprising:

(a) extruding the zirconium-based alloy into an extruded product;

(b) subjecting the extruded product to a plurality of cold rollings;

(c) prior to one of said cold rollings, subjecting the extruded product to β-quenching;

(d) after said β-quenching and the associated cold rolling, subjecting the extruded product to an intermediate annealing at a temperature of 500° to 675° C.;

(e) subjecting the extruded product to a final cold rolling; and

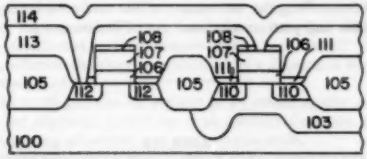
(f) subjecting the extruded product to a final annealing.

4,450,021

MASK DIFFUSION PROCESS FOR FORMING ZENER DIODE OR COMPLEMENTARY FIELD EFFECT TRANSISTORS

Tarsaim L. Batra, Cupertino, and Scott Bowden, San Jose, both of Calif., assignors to American Microsystems, Incorporated, Santa Clara, Calif.

Filed Feb. 22, 1982, Ser. No. 351,075
Int. Cl.³ H01L 21/22, 21/265
U.S. Cl. 29—571 5 Claims



1. The method of forming a complementary metal oxide-silicon device within a substrate of first conductivity type comprising the steps of:

forming within said substrate a well region of a second conductivity type which is opposite said first conductivity type;

forming a field region in all areas where active devices are not to be formed, thus exposing active regions on the surface of said substrate in which active devices are to be formed;

forming a gate dielectric layer within said active regions;

forming a gate region on said gate dielectric layer;

masking said substrate with a first protective layer;

patterning said first protective layer and said gate insulation layer to expose only those active regions on the surface of said well region;

doping source and drain regions to said first conductivity type within said well region which are not protected by said gate regions or said field regions;

forming a second protective layer on the surface of said substrate not protected by said first protective layer, said field region or said gate region;

removing said first protective layer; and

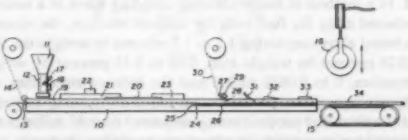
doping source and drain regions to a second conductivity type within said substrate which are not protected by said second protective layer, said field region or said gate region.

4,450,022

METHOD AND APPARATUS FOR MAKING REINFORCED CEMENT BOARD

Richard E. Galer, Hanover Park, Ill., assignor to United States Gypsum Company, Chicago, Ill.

Filed Jun. 1, 1982, Ser. No. 383,674
Int. Cl.³ B28B 1/30, 23/02; B32B 31/00
U.S. Cl. 156—42 19 Claims



1. A method for manufacturing a reinforced cementitious panel comprising:

continuously forming a slurry comprising a cementitious material and water;

continuously towing an indefinitely long carrier sheet over a support surface;

continuously laying an indefinitely long span of reinforcing fibers over said sheet;

placing said sheet and its fiber overlay under longitudinal tension;

continuously depositing said slurry on said overlay and distributing it across the breadth of the overlay;

creating a gap between said sheet and said overlay to be filled by said slurry, said gap substantially spanning the breadth of the overlay and being created by urging a first transverse zone of said sheet to travel through a higher plane than a second transverse zone immediately adjacent to and downstream from the first zone;

thereby causing said slurry to embed said fibers; and

cutting the reinforced panel into the desired lengths.

16. Apparatus for the continuous manufacture of reinforced cementitious paneling, said apparatus comprising:

a forming table and a conveyor belt for continuously feeding a carrier sheet along a predetermined path, means for continuously laying reinforcing fibers over the advancing sheet, means for urging a first transverse zone of said sheet to travel through a higher plane than a second transverse zone of said sheet immediately adjacent to and downstream from the first zone thereby creating a gap transverse to said path between said sheet and the fiber overlay, means for depositing a cementitious slurry on the advancing fiber overlay upstream from said gap-creating means, means for leveling said slurry and distributing it transversely to said path, whereby said slurry is caused to fill said gap and embed said fiber overlay during its passage over said gap-creating means.

4,450,023

THERMOCHROMIC COMPOSITION

Francis J. A. M. C. De Blauwe, Lubbeek, Belgium, assignor to N.V. Raychem S.A., Kessel, Belgium

Filed Jun. 12, 1981, Ser. No. 273,179

Int. Cl.³ B32B *31/00*; C09K *3/00*; G01K *11/12*

U.S. Cl. 156—64 **18 Claims**

1. A heat recoverable article which is to be heated to a pre-selected temperature during installation or use having on a surface thereof a thermochromic composition comprising at least one organic binder and at least one organic material which undergoes a transformation when the article is heated to said pre-selected temperature, to produce a visible color change; said binder interacting with the transformed organic material to inhibit leaching thereof from the composition; whereby a substantially non-reversible color change of said composition takes place when said article is heated to said preselected temperature.

4. An article according to claim **1** or **2**, capable of forming an enclosure about a body, having a meltable sealant on the surface which will face the interior of the enclosure, and the thermochromic composition on the surface which will be visible when the article is enclosing the body.

17. A method of enclosing a body, comprising positioning around the body a heat-recoverable article according to claim **4**, and heating the article so as to recover it about the said body or so as to cause said sealant to melt or to soften, and to cause the thermochromic composition to undergo the visible colour change.

18. A thermochromic composition capable of adhering to a surface of a heat recoverable article which is to be heated to a pre-selected temperature during installation or use, said composition comprising at least one organic binder and at least one organic material which undergoes a transformation when the article is heated to said pre-selected temperature to produce a visible color change; said binder interacting with the transformed organic material to inhibit leaching thereof from the composition.

4,450,024

IDENTIFICATION CARD WITH AN IC-MODULE AND METHOD FOR PRODUCING IT

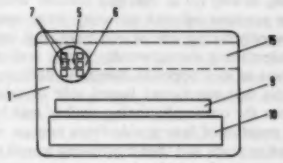
Yahya Haghiri-Tehrani, and Joachim Hoppe, both of Munich, Fed. Rep. of Germany, assignors to GAO Gesellschaft für Automation und Organisation mbH, Munich, Fed. Rep. of Germany

Filed Jul. 30, 1981, Ser. No. 288,496

Claims priority, application Fed. Rep. of Germany, Aug. 7, 1980, 3029939

Int. Cl.³ B60J *1/00*

U.S. Cl. 156—108 **12 Claims**



1. A method for producing a multi-layer identification card having an IC-module for processing electrical signals, the IC-module with its connection leads being arranged on a separate carrier element that is small relative to the identification card, said method avoiding localized pressures on the carrier element during production of the card and comprising the steps of:

providing an identification card assembly including an internal layer having a recess for the carrier element and at least one covering layer heat sealable to the internal layer, at least one of said layers being thermally softenable;

inserting the carrier element in the recess;

before or after inserting the carrier element in the recess, establishing a buffer proximate to the carrier element for limiting the application of force to the carrier element prior to thermal softening of the card layer; and

applying heat and pressure to the identification card assembly to heat seal the layers together, said buffer limiting the application of force to the carrier element prior to softening of the thermally softenable layer to avoid localized pressure on the carrier element.

4,450,025

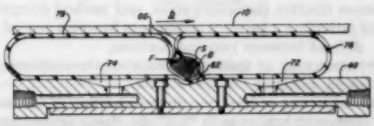
METHOD AND APPARATUS FOR WRAPPING A TIRE BEAD RING

Virgil E. Henley, Akron, Ohio, assignor to The General Tire & Rubber Company, Akron, Ohio

Filed Jan. 31, 1983, Ser. No. 462,284

Int. Cl.³ B29H *17/12*, *17/34*

U.S. Cl. 156—132 **1 Claim**



1. A method of wrapping a bead ring comprising the steps of:

(a) placing a bead covering strip on a deflated bladder that extends across a circumferentially extending recess in the surface of an expansible drum, so that said bead covering strip extends around said drum and said bladder extends over said recess;

(b) radially expanding said drum to receive said bead ring in said recess, with said bead covering strip and said bladder being interposed between said bead ring and said drum;

(c) inflating said bladder on one lateral side of said bead ring to raise a first edge portion of said covering strip, and rolling an outwardly facing wall of said bladder axially to carry said bladder over said bead ring and wrap said first edge portion of said strip over the radially outwardly facing side of said bead ring and press said first edge portion against the other edge portion of said strip on the opposite lateral side of said bead ring;

(d) inflating the portion of said bladder on the opposite lateral side of said bead ring from the side inflated in step (c) to raise the other edge portion of said covering strip, and rolling the outwardly facing wall of said bladder portion in the opposite direction from the direction of said rolling in step (c) so that said bladder wraps both of said edge portions of said covering strip over the radially outwardly facing side of said bead ring; and

(e) while rolling the outwardly facing wall of said bladder portion in said opposite direction, deflating said bladder on the first mentioned lateral side of said bead ring to release the outwardly facing wall of said bladder on said first mentioned lateral side from contact with said bead covering strip, and then continuing to roll said outwardly facing wall of said bladder portion in said opposite direction to press the edge portions of said covering strip tight against the outer surface of said strip.

4,450,026

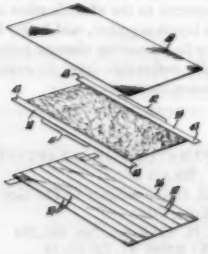
METHOD OF FORMING A CONFORMABLE GARMENT WITH "KILLED" ELASTIC PORTIONS

Heinz A. Pieniak, Chicago, and Virginia L. Repke, Oak Forest, both of Ill., assignors to Johnson & Johnson Baby Products Company, New Brunswick, N.J.

Division of Ser. No. 106,336, Dec. 21, 1979, Pat. No. 4,337,771, which is a continuation-in-part of Ser. No. 872,860, Jan. 27, 1978, abandoned. This application Jun. 23, 1982, Ser. No. 391,326

Int. Cl.[3] **A61F** *13/16*; **B32B** *31/08, 31/18*

U.S. Cl. 156—164 **10 Claims**



1. A method for forming a conformable garment having one or more discrete elasticized areas, said method comprising:

(a) providing a garment component having a central portion defined between two end portions;

(b) stretching at least one ribbon of thermoplastic elastomeric material;

(c) subjecting at least one discrete portion of said stretched ribbon to heat so as to "kill" the elastic properties thereof in each heated portion while leaving the elastic properties of each unheated portion unaltered;

(d) before, during, or after step (c), securing at least part of the stretched ribbon to said garment component substantially end-to-end of the garment component with one heated portion of the ribbon secured in an end portion of said garment component and with an unheated portion of the ribbon secured to the central portion of said garment component whereby, when said ribbon is permitted to contract with said garment component, said garment component central portion is elasticized to gather while at least one end portion of said garment component remains inelastic and ungathered.

4,450,027

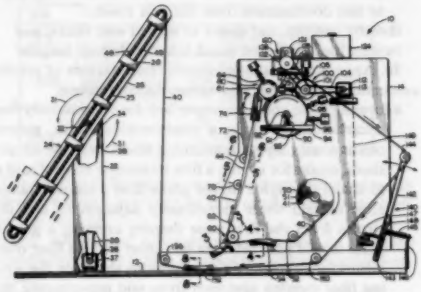
METHOD AND APPARATUS FOR FABRICATING HONEYCOMB INSULATING MATERIAL

Wendell B. Colson, 1611 Belero St., Broomfield, Colo. 80020

Filed Aug. 9, 1982, Ser. No. 406,319

Int. Cl.[3] **B29C** *17/00*

U.S. Cl. 156—193 **20 Claims**



1. The method of fabricating expandable honeycomb material, comprising the steps of:

continuously folding a continuous length of tubular material at diametrically opposite sides into a flat tubular form

passing said length of tubular material over a heated surface and heating the tubular material uniformly across its entire transverse cross section and then passing said length of tubular material over a cold surface and cooling the tubular material uniformly across its entire transverse cross section, while continuously maintaining a uniform tension on said tubular material as it passes over the heated and cold surfaces and while maintaining the folds during heating and cooling by pressing a plurality of rollers against the folded tubular material on said heated and cold surfaces;

applying an adhesive material longitudinally along the length of said folded tubular material;

stacking the continuous length of tubular material on a rack that has an elongated flat surface in such a manner that the tubular material is stacked on the flat surfaces in a plurality of adjacent layers one on another with the adhesive material positioned between each layer;

allowing the adhesive material to adhere one layer to another to form a unitary stack on said flat surface; and

cutting a straight section of the unitary stack on the flat surface away from the remainder of the stacked tubular material and removing it from the rack.

4,450,028

METHOD OF MAKING LAMINATED MULTI-LAYERED FILM ENCLOSURES

Leonard J. Vilutis, Frankfort, Ill., assignor to Vilutis and Co., Inc., Frankfort, Ill.

Filed Dec. 2, 1981, Ser. No. 326,701

Int. Cl.[3] **B29C** *17/00*; **B32B** *31/20*

U.S. Cl. 156—198 **4 Claims**

1. A method for making a multi-layered enclosure comprising:

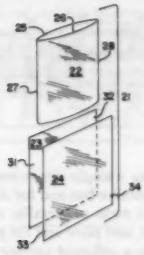
selecting a length of extruded tubing having two panels integral with each other, said panels being integrally joined along two longitudinal edges that are continuous with both of said two tubing panels;

juxtaposing one length of film sheeting in overlying relationship to one of said tubing panels, said one length of film

sheeting having two longitudinal edges complementary to said tubing longitudinal edges;

juxtaposing another length of film sheeting in overlying relationship to the other of said tubing panels, said another length of film sheeting having two longitudinal edges complementary to said tubing longitudinal edges; and

laminating together each of said length of extruded tubing, said one length of film sheeting and said another length of film sheeting to form a multi-layered enclosure, said laminating step including laminating said one length of film sheeting to substantially the entire outside surface of one of said tubing panels, and laminating said another length of film sheeting to substantially the entire outside surface of the other of said tubing panels, said laminating step further



including simultaneously laminating one of said two longitudinal edges of the one length of film sheeting to one of said two longitudinal edges of the another length of film sheeting in order to form a first laminated edge section, and simultaneously laminating the other of said two longitudinal edges of the one length of film sheeting to the other of said two longitudinal edges of the another length of film sheeting in order to form a second laminated edge surface, wherein said laminating step simultaneously adheres substantially the entire outside surface of the tubing, the length of film sheeting and the another length of film sheeting together while avoiding any significant change in the structure or the thickness of the tubing or the lengths of film sheeting.

4,450,029

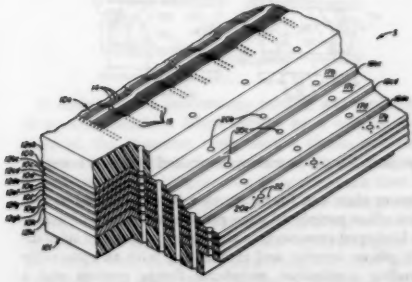
BACKPLANE FABRICATION METHOD

Kenneth W. Holbert, Sunnyvale, and Edwin M. Massey, San Jose, both of Calif., assignors to Elxsi, San Jose, Calif.

Filed Jan. 13, 1982, Ser. No. 339,033

Int. Cl.³ B32B *31/18*; H05K *1/04*

U.S. Cl. 156—250 **13 Claims**



1. A method of fabricating a backplane power distribution system comprising the steps of:

providing a first dielectric layer having a signal layer on one side thereof;

providing a conductive layer;

providing a second dielectric layer;

applying a release agent to a substantial area of the conductive layer;

laminating, in order, the first dielectric layer, the conductive layer, and the second dielectric layer to produce a rigid laminated structure with the signal layer on the outside and the conductive layer and the first and second dielectric layers generally coextensive; and

removing a portion of the first dielectric layer to expose the substantial area of the conductive layer.

4,450,030

ADHESIVE BONDING METHOD EMPLOYING TWO-PART COMPOSITION WITH ACTIVATOR ENRICHED WITH DIHYDROPYRIDINE INGREDIENTS

David P. Melody, Castlenock; Seamus M. Grant, Ballinteer, and Francis R. Martin, Templeogue, all of Ireland, assignors to Loctite Corporation, Newington, Conn.

Division of Ser. No. 321,643, Nov. 16, 1981, Pat. No. 4,430,480. This application Nov. 21, 1983, Ser. No. 553,712

Claims priority, application Ireland, Nov. 21, 1980, 2423/80

Int. Cl.³ C09J *5/02*

U.S. Cl. 156—307.3 **7 Claims**

1. In a method of bonding a pair of substrates comprising coating an activator comprising condensation products of butryaldehyde and aniline onto at least one of said substrates, applying a free radical catalyzed polymer in monomer type adhesive onto at least one of said substrates and joining the two substrates for sufficient time to permit the adhesive to cure, the improvement comprising that the concentration of N-phenyl-3,5-diethyl-2-propyl-1,2-dihydropyridine in said activator is present in an amount of about 70% or more of said condensation products.

4,450,031

ION SHOWER APPARATUS

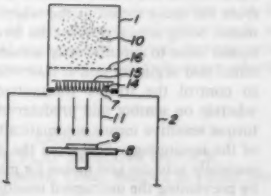
Toshiro Ono, and Seitaro Matsuo, both of Isehara, Japan, assignors to Nippon Telegraph & Telephone Public Corporation, Tokyo, Japan

Filed Sep. 8, 1983, Ser. No. 530,424

Claims priority, application Japan, Sep. 10, 1982, 57-156842; Oct. 4, 1982, 57-173270

Int. Cl.³ C23F *1/02*; C03C *15/00*; B44C *1/22*; H01L *21/306*

U.S. Cl. 156—345 **9 Claims**



1. An ion shower apparatus comprising:

a plasma formation chamber in which a plasma is produced so as to produce ions;

a single ion extraction electrode disposed in one portion of said plasma formation chamber and for extracting said ions from said plasma formation chamber so as to form an ion beam in the form of shower;

a specimen chamber in which the surface of a specimen is irradiated with said ion beam in the form of shower; and

a shield electrode disposed in the vicinity of said ion extraction electrode in said plasma formation chamber and spaced apart from the thickness of the plasma sheath produced over said ion extraction electrode, said shield electrode permitting the passage of said plasma therethrough and preventing the electric field produced by said

ion extraction electrode substantially from extending to the remaining region of said plasma formation chamber.

4,450,032

APPARATUS FOR BANDING PARCELS AND THE LIKE

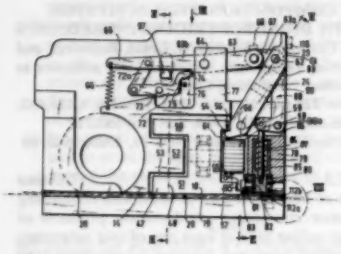
Hubert Wehr, Bornheim, Fed. Rep. of Germany, assignor to Cyklop International Emil Hoffmann KG, Fed. Rep. of Germany

Filed May 10, 1982, Ser. No. 376,578

Claims priority, application Fed. Rep. of Germany, May 12, 1981, 3118710

Int. Cl.³ B29C *27/08*; B65B *13/32*

U.S. Cl. 156—353 **13 Claims**



1. An apparatus for securing a band around an article, comprising:

a rotatable tensioning wheel for applying tension to a band;

a unidirectional drive means;

coupling means operationally intermediate said drive means and said wheel whereby said wheel is rotatable by said drive means;

at least one frictional element arranged to be reciprocable by said drive means;

urging means for urging said at least one friction element against a first portion of a band which overlies a second portion of the band, said portions being tensionable by said tensioning wheel, while said at least one element is reciprocated by said drive means, whereby the first band portion is reciprocable relative to and in contact with the second band portion;

wherein said coupling means includes means for maintaining band tension and means sensitive to the torque transmitted from the drive means to the wheel, said torque sensitive means being actuated when the torque attains a predetermined value to automatically actuate said urging means to effect said urging of said at least one friction element, and to control the torque transmitted to the wheel, and wherein on sensing said predetermined torque value said torque sensitive means automatically actuates uncoupling of the tensioning wheel from the drive means and automatically actuates said means for maintaining band tension by preventing the uncoupled tensioning wheel from rotating.

4,450,033

FRONT SURFACE METALLIZATION AND ENCAPSULATION OF SOLAR CELLS

Roger G. Little, Bedford, Mass., assignor to Spire Corp., Bedford, Mass.

Division of Ser. No. 310,793, Oct. 13, 1981, which is a continuation of Ser. No. 181,106, Aug. 25, 1980, abandoned. This application Aug. 30, 1982, Ser. No. 412,993

Int. Cl.³ B32B *19/02*; C03B *23/20, 33/08*; H01C *7/08*

U.S. Cl. 156—380.8 **5 Claims**

1. Apparatus for the front surface metallization and encapsulation of solar cells comprising:

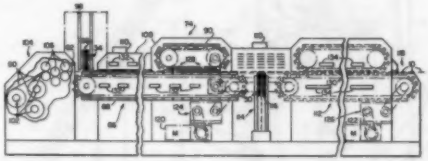
(a) means for forming a single dimensional mesh of metallic wires with a conductive bus and for depositing a transparent plate onto said mesh of metallic wires;

(b) means for bringing a front surface of a semiconductor wafer into contact with said plate and said mesh of metallic wires thereon;

(c) means for electrostatically bonding said transparent plate to said semiconductor wafer, with said mesh of metallic wires encapsulated therebetween; and

(d) means for pressing said transparent plate to said semiconductor wafer while effecting said electrostatic bonding therebetween.

2. Apparatus for the front surface metallization and encapsulation of solar cells comprising:



(a) means for forming a single-dimensional mesh of metallic wires with a conductive bus and for depositing a transparent plate onto said mesh of metallic wires;

(b) means for heating said plate and for pressing said mesh of metallic wires into a softened surface of said plate;

(c) means for bringing a front surface of semiconductor wafer into contact with said surface of said plate and said mesh of metallic wires embedded therein;

(d) means for electrostatically bonding said plate surface to said front surface of said semiconductor wafer, with said mesh of metallic wires encapsulated therebetween; and

(e) means for pressing said plate surface to said front surface of said semiconductor wafer while effecting said electrostatic bonding therebetween.

4,450,034

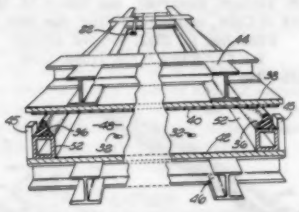
LAMINATOR FOR LARGE WORKPIECES

Michael J. Stern, Chatsworth, Calif., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Jun. 10, 1982, Ser. No. 387,100

Int. Cl.³ B30B *15/34*

U.S. Cl. 156—382 **2 Claims**



1. Apparatus for use in making laminated products comprising:

(a) a lower plate unit for receiving a workpiece and having a first offset peripheral edge porition and being of generally U-shaped cross section and having a recessed substantially planar interior and terminating with an outwardly extending continuous peripheral flange portion and a plurality of elongated members forming frames about the periphery of said lower plate unit secured to said flange portion for reinforcing the edge portion of said generally U-shaped lower plate;

(b) an upper plate unit for providing a hood over said lower unit and having a second offset peripheral edge portion

and being of generally U-shaped cross section and having a recessed substantially planar interior and terminating with an outwardly extending continuous peripheral flange portion and a plurality of elongated members forming frames about the periphery of said upper unit secured to said flange portion for reinforcing the edge portion of said generally U-shaped upper plate;

(c) flexible diaphragm means disposed between said upper and lower plate units and defining upper and lower chambers;

(d) adhesive means for securing said diaphragm means to the peripheral edge of said upper plate unit;

(e) said first and second peripheral edges being in abutting relationship with said diaphragm therebetween when said upper and lower plate units are closed;

(f) a peripheral rib of molded elastomeric material for providing a peripheral sealable relationship between said diaphragm means and said upper and lower plate units so that said chambers may be rendered air tight; and

(g) evacuating means for evacuating said upper and lower chambers.

4,450,035

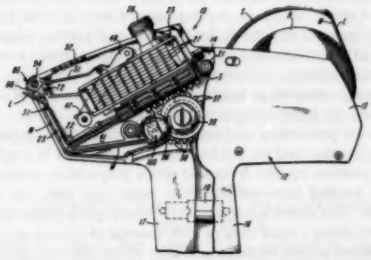
LABEL PRINTING AND APPLYING APPARATUS

Paul H. Hamisch, Jr., Franklin, and James A. Makley, Miamisburg, both of Ohio, assignors to Monarch Marking Systems, Inc., Miamisburg, Ohio

Filed Mar. 15, 1983, Ser. No. 475,396

Int. Cl.³ B65C *9/18, 11/02*

U.S. Cl. 156—384 **15 Claims**



1. Apparatus for successively printing and applying a series of pressure sensitive labels carried by a web of supporting material, the apparatus comprising a platen, printing means cooperable with the platen for successively printing the labels, delaminating means disposed for separating each label from the web after the label is printed, means for feeding the web to present each label to the platen and printing means and then past the delaminating means, a roller for directing the labels or the carrier web, an adaptor supporting the roller for rotation on a first axis when the apparatus is assembled for printing relatively short labels, means for supporting the adaptor, and the adaptor supporting means being effective to support the roller or another roller for rotation on a second axis spaced parallel to the first axis when the apparatus is assembled without the adaptor printing longer labels.

4,450,036

PORTABLE LABELING MACHINE

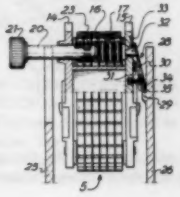
Heinrich Volk, Beerfelden-Gammelsbach, Fed. Rep. of Germany, assignor to Esselte Pendaflex Corporation, Garden City, N.Y.

Filed Jun. 3, 1982, Ser. No. 384,718

Claims priority, application Switzerland, Jul. 17, 1981, 4695/81

Int. Cl.³ B65C *11/02*

U.S. Cl. 156—384 **4 Claims**



1. A portable labeling machine having a housing extended by a handle with control lever and comprising at least a movable printhead driven by the control lever to imprint by striking movements selected characters on self-adhesive labels supported by a continuous strip, said printhead being provided with a character selection shank rotatively and axially movable along its longitudinal axis from a rest inward position up to outward selection positions and with stop means for maintaining said character selection shank in any one of said positions, and a safety device adapted to prevent the striking movements of the printhead when the character selection shank is not completely in its rest inward position, which safety device comprises a retractable movable abutment and a stationary counter-abutment, said retractable movable abutment having a protruding position in which it engages said counter-abutment in the rest position of the printhead to prevent the striking movements of the printhead and a retracted position in which said retractable movable abutment does not engage said counter-abutment and does not prevent the striking movements of the printhead, wherein one of said retractable movable abutment and stationary counter-abutment is mounted on the printhead and the other is mounted on the housing, spring means in contact with said retractable movable abutment to permanently bias said retractable movable abutment to urge it into the protruding position, wherein an antagonist thrust member is axially bound to the character selection shank to urge said retractable movable abutment into retracted position at the end of the inward stroke of said character selection shank, and wherein the bias of said spring means is lower than the retaining force of the stop means acting on said character selection shank.

4,450,037

ENVELOPE FLAP SEALING DEVICE

German Gavronsky, Stamford, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.

Filed Jun. 22, 1983, Ser. No. 506,913

Int. Cl.³ B05C *1/02*

U.S. Cl. 156—441.5 **6 Claims**

1. In a mailing machine, an envelope flap sealing device, comprising:

a moistener separator blade;

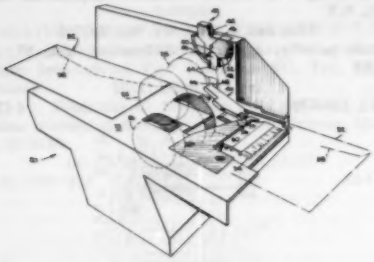
a moistening brush attached to and located downstream of said separator blade;

at least one pair of feed rollers for transporting envelopes past said moistening brush;

a pivotable, deflecting baffle situated intermediate said feed rollers and said separator blade; and

a selector knob having a camming surface, said knob being operatively connected to said deflecting baffle for pivoting said baffle about its downstream end whereby the

upstream end of said baffle is translatable between a raised position and a flat position, wherein the raised position guides an envelope flap under said moistening brush to



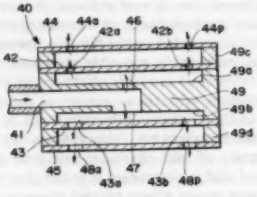
thereby seal said flap and the flat position causes said envelope flap to pass over said moistening brush and not be sealed.

4,450,038

HOT AIR BLAST WELDING APPARATUS FOR THERMOPLASTIC PARTS

Masami Ishii, Toyota; Hitoshi Sugimoto, Nagoya; Shinji Takeda, Toyota, and Susumu Shibata, Okazaki, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Feb. 18, 1982, Ser. No. 349,713
Claims priority, application Japan, Feb. 26, 1981, 56-28150
Int. Cl.³ B32B *35/00*
U.S. Cl. 156—497 **3 Claims**



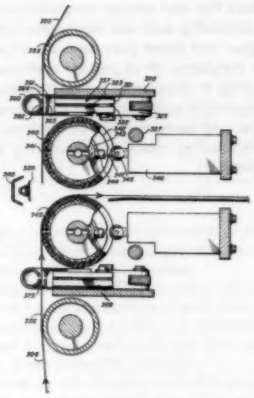
1. A hot-air-blast welding apparatus comprising a pair of opposed, work-holding arms which are movable toward and away from each other and respectively have means for holding hollow works having edges to be welded together, hot-air blasting means including hot-air blast nozzle means movable between an operative position in which said nozzle means are located between the works held on said arms and a retracted position in which said nozzle means are retracted so that the works on the arms can be brought into abutting engagement with each other by moving the arms toward each other, and including a conduit connected to said nozzle means for supplying hot air to said nozzle means, said nozzle means being formed with first nozzle openings facing toward one work held on one of the arms and second nozzle openings facing toward the other work held on the other arm, said conduit commonly supplying hot air to said first and second nozzle openings, said nozzle means having means for directing different amounts of hot air respectively to the first and second nozzle openings including air ports respectively leading to the first and second nozzle openings, said ports having different effective areas.

4,450,039

WEB SPLICING APPARATUS

Orfeo J. Salvucci, Holbrook; John M. Hobby, Sherborn; James J. Hennessy, Woburn, all of Mass., and Ronald R. Young, Pawtucket, R.I., assignors to Harris Graphics Corporation, Westerly, R.I.

Filed Aug. 23, 1982, Ser. No. 410,508
Int. Cl.³ B65H *19/08, 19/22;* B32B *31/00;* B26F *3/02*
U.S. Cl. 156—504 **26 Claims**



1. In web splicing apparatus having a ready roll of web material and an expiring roll of web material, a pair of resilient nip rollers operable to splice the leading edge of web material from said ready roll to the trailing edge of web material from said expiring roll, an idler roller to guide said leading edge to one of said nip rollers, and means operable during splice preparation and a splicing operation for holding and trimming said leading edge adapted to become engaged with either of said nip rollers, the improvement comprising:

means for positioning said one nip roller in a splice preparation position and for holding said one nip roller in a splicing position rotated from said splice preparation position,

means located between said idler roller and said one nip roller, said means being operable during splice preparation for drawing a slack loop of web material of precise, predetermined length between said idler roller and said one nip roller so that sad one nip roller can be rotated to said splicing position and during a splicing operation there is substantially no slack in said web material between said idler roller and said one nip roller.

9. In web splicing apparatus having a ready roll of web material and an expiring roll of web material, a pair of resilient nip rollers operable to splice the leading edge of web material from said ready roll to the trailing edge of web material from said expiring roll, and an idler roller to guide said leading edge to one of said nip rollers, the improvement comprising:

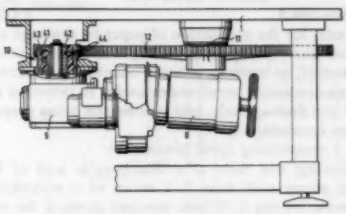
a trimming blade for trimming the leading edge of said ready roll during splice preparation, and

means operable to position said trimming blade in front of either nip roller during splice preparation in a position so as to allow said leading edge to be ripped off against said blade.

4,450,040
NOISEPROOFED LABELING MACHINE

Rodolf Zodrow, and Rainer Buchholz, both of Düsseldorf, Fed. Rep. of Germany, assignors to Jagenberg AG, Dusseldorf, Fed. Rep. of Germany

Filed Feb. 18, 1982, Ser. No. 349,931
Claims priority, application Fed. Rep. of Germany, Mar. 27, 1981, 3112067
Int. Cl.³ B65C 9/02; F16H 55/14
U.S. Cl. 156—567 8 Claims

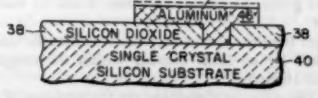


1. In a labeling machine comprising a machine frame, a turret in said frame, a concentrically disposed gear carried by said turret for rotation of said turret, a plurality of turntables carried by said turret, a drive mounted in the machine frame, a pinion driven by said drive and driving said concentrically disposed gear and turret, an infeed starwheel and an outfeed starwheel each meshing with the concentrically disposed gear, and a labeling station driven by a pinion meshing with the turret gear, the improvement which comprises providing each gear of the infeed and outfeed starwheels, of each pinion of the drive and of the labeling station, and any further pinions meshing with the gear of the turret and driving, in synchronism with the turret, other mechanisms mounted in the machine frame, with a hub, a toothed ring and a polyurethane elastomer damping element between each hub and toothed ring so as to isolate said hub and said toothed ring from each other with respect to solid-borne sound, each toothed ring and hub having beveled regions bounding the space between them, each damping element having been formed by temporarily surrounding the space with a collar to form a closed space, casting into said space a polyurethane-forming material which sets to an elastomer with shrinkage, allowing the material to set so that in shrinking the elastomer in at least one point is drawn against the beveled regions so as to center itself in the manner of a chucking cone, thereby constituting the damping connection, and removing the temporary collar.

4,450,041
CHEMICAL ETCHING OF TRANSFORMED STRUCTURES

Monti E. Aklufi, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 21, 1982, Ser. No. 390,458
Int. Cl.³ C23F 1/02; B44C 1/22; C03C 15/00; H01L 21/306
U.S. Cl. 156—628 1 Claim



1. A method of selectively etching a metal comprising the steps of:

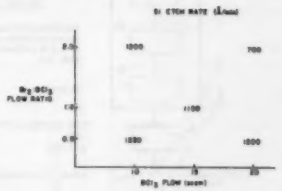
(a) subjecting a predetermined region of a layer of metal to impingement by a silicon ion beam so as to ion implant said predetermined region;

(b) applying a chemical etch to said layer of metal and to said ion implanted region whereby said ion implanted region etches at a slower rate than the portion of said metal outside said predetermined region.

4,450,042
PLASMA ETCH CHEMISTRY FOR ANISOTROPIC ETCHING OF SILICON

Andrew J. Purdes, Garland, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Jul. 6, 1982, Ser. No. 395,205
Int. Cl.³ H01L 21/306; B44C 1/22; C03C 15/00, 25/06
U.S. Cl. 156—643 17 Claims



1. The method for selectively etching a layer of a silicon-bearing material in an integrated circuit, comprising the steps of:

providing a patterned masking material over said silicon-bearing material to expose only the areas of said silicon-bearing material which are to be etched;

passing a gaseous mixture over said layer; and

creating a plasma discharge in said gaseous mixture adjacent to said layer of silicon-bearing material;

wherein said gaseous mixture comprises bromine and a chlorine-bearing species.

4,450,043
METHOD FOR RECOVERING PULP FROM PRESSURE-SENSITIVE CARBONLESS COPYING PAPER WASTE

William J. Schulz, Cloquet, Minn., assignor to Appleton Papers Inc., Appleton, Wis.

Filed Mar. 12, 1982, Ser. No. 357,400
Int. Cl.³ D21C 5/02
U.S. Cl. 162—5 7 Claims

1. A process for the recovery of fibers from pressure-sensitive carbonless copying paper waste having color former containing microcapsules, comprising the steps of:

(a) defibrating the waste in aqueous media in two steps without substantial rupture of the microcapsules wherein one defibrating step is performed under acidic conditions and the other step is performed under basic conditions;

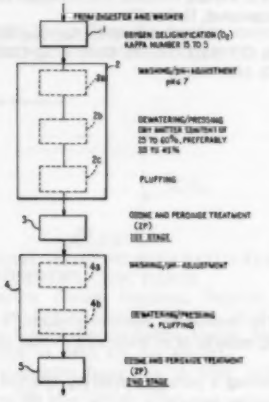
(b) treating the defibrated waste with an enzyme for starch saccharification; and,

(c) separating the fibers from the non-fibrous components in a sidehill screen equipped with a washing shower.

4,450,044
METHOD FOR BLEACHING OXYGEN DELIGNIFIED CELLULOSE-CONTAINING PULP WITH OZONE AND PEROXIDE

Bjorn H. Fritzvold, Hosle, and Nicolai Soteland, Oslo, both of Norway, assignors to Myrens Verksted A/S, Oslo, Norway

Continuation of Ser. No. 161,871, Jun. 23, 1980, abandoned, which is a continuation of Ser. No. 26,644, Apr. 3, 1979, abandoned. This application Jul. 19, 1982, Ser. No. 400,115
Claims priority, application Norway, Apr. 4, 1978, 781190
Int. Cl.³ D21C 9/16
U.S. Cl. 162—65 13 Claims



1. In a method of bleaching coniferous wood pulp wherein said pulp is first oxygen delignified to a kappa number of 5 to 15 and then bleached by treatment with ozone and peroxide, the improvement consisting essentially of the sequential steps of:

(A) a first stage having

(1) an ozone treatment comprising the sequential steps of washing and pH adjustment with an acid to a pH≦7, dewatering to 25–60% dry matter, fluffing, and treatment with ozone, and immediately following the ozone treatment

(2) an alkaline peroxide treatment comprising treatment with a composition consisting essentially of water, an alkaline, a complex former, and a peroxide; and

(B) a second stage having

(1) an ozone treatment comprising the sequential steps of washing and pH adjustment with an acid to a pH≦7, dewatering to 25–60% dry matter, fluffing, and treatment with ozone, and immediately following the ozone treatment

(2) an alkaline peroxide treatment comprising treatment with a composition consisting essentially of water, an alkaline, a complex former, and a peroxide;

with the proviso that 55–85% of the total quantity of chemicals are used in the first stage.

4,450,045
PREPARATION OF WATER-SOLUBLE, NITROGEN-CONTAINING CONDENSATES AND THEIR USE IN PAPERMAKING

Otto Hertel, Ludwigshafen; Friedrich Linhart, Heidelberg, and Emil Scharf, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Sep. 10, 1982, Ser. No. 416,614
Claims priority, application Fed. Rep. of Germany, Sep. 10, 1981, 3135830
Int. Cl.³ D21H 3/58
U.S. Cl. 162—164.3 6 Claims

1. A process for the production of paper by drainage of an aqueous fiber slurry, comprising: adding to said slurry, prior to drainage thereof, an aqueous solution comprising water-soluble, nitrogen-containing condensates useful as retention aids, flocculants and drainage aids, said condensates being prepared by a process consisting of;

reacting a crosslinking agent obtained by

(a) condensing one mole of a dicarboxylic acid of 4–10 carbon atoms with from 1–2 moles of a polyalkylene polyamine, having 3–10 basic nitrogen atoms in the molecule, to give a polyamidoamine and,

(b) reacting the polyamidoamine with epichlorohydrin and/or dichlorohydrin in aqueous solution at a pH of from 4.5 to 8.5 and at not more than 100° C., from 1 to 130 parts by weight of epichlorohydrin and/or dichlorohydrin being employed per 100 parts by weight of the polyamidoamine from (a), with

(c) a diamine consisting of ethylenediamine, such that the resulting water-soluble resin has a viscosity of not less than 100 m PAS, measured in 20% strength aqueous solution at 20° C.

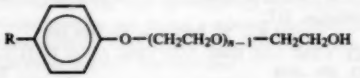
4,450,046
METHOD FOR INCREASING THE WET BULK DENSITY OF COKING COALS

David A. Rice, Hellertown; Robert R. Greenbaum, Coopersburg, and Thomas J. Conarty, Jr., Lehighton, all of Pa., assignors to Bethlehem Steel Corp., Bethlehem, Pa.

Filed Jun. 14, 1982, Ser. No. 388,000
Int. Cl.³ C10B 57/06, 57/08
U.S. Cl. 201—20 8 Claims

1. An improved method for increasing the wet bulk density of moist coking coals charged to coke ovens to an optimum level and controlling and maintaining the wet bulk density of the coals in the moisture range of 6 to 13 weight percent at the optium level wherein the coals are prepared from raw coals which are treated and washed in coal preparation plants and crushed in the coke plants, the improvement comprising;

(a) preparing an aqueous dispersion containing between about 5 and 20 weight percent of an aliphatic, linear, non-ionic compound of an alkylphenoxypoly (ethyleneoxy) ethanol surfactant having a general structure



wherein:

R is an alkyl group containing between 8 and 12 carbon atoms, and

n is an integer between 2 and 30, where said surfactant is characterized by an HLB number within the range of about 8 and 16, and

(b) spraying the aqueous dispersion on the surfaces of the coals in amounts equivalent to between about 0.5 and 2.5 pounds of the surfactant per ton of coals (0.227 and 1.135 kg. of surfactant per 907.2 kg of coals) to increase and maintain the wet bulk density thereof at a level between

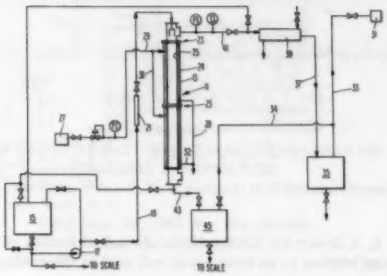
about 47 and 50 pounds per cubic foot, as determined by standard ASTM D291-60.

4,450,047

PROCESS FOR RECOVERING ANHYDROUS ALKANESULFONIC ACIDS BY REDUCED PRESSURE, FALLING FILM EVAPORATION

Dale E. Malzahn, Dearborn Heights, Mich., assignor to Penwalt Corporation, Philadelphia, Pa.

Filed Jan. 28, 1983, Ser. No. 461,776
Int. Cl.³ B01D *3/10, 1/22*; C07C *143/02*
U.S. Cl. 203—15 **12 Claims**



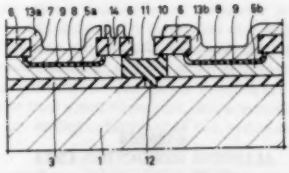
1. A process for reducing the water content of a lower-alkanesulfonic acid comprising placing a mixture containing water and said lower-alkanesulfonic acid onto the internal surface of an evaporator column so as to form a falling film of said mixture on said surface, operating said column at subatmospheric pressure and heating said surface so that water is vaporized from said mixture as said film flows down said surface, removing water vapor at the top of said column, and removing lower-alkanesulfonic acid having a water content of less than 2 percent and no detectable amounts of carcinogenic decomposition products at the bottom of said column.

4,450,048

METHOD OF MANUFACTURING CAPACITORS INTEGRATED IN MICROELECTRONIC STRUCTURE

Yves Gaulier, Herouville, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 5, 1983, Ser. No. 510,531
Claims priority, application France, Jul. 9, 1982, 82 12137
Int. Cl.³ C25D *11/04, 11/12*
U.S. Cl. 204—15 **4 Claims**



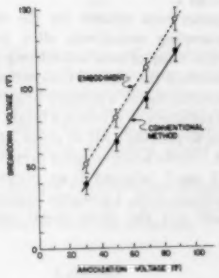
1. A method of manufacturing capacitors integrated in a microelectronic structure at the surface of a semiconductor body, the plates of these capacitors being obtained from two metal layers which are superimposed, are insulated at least in part from the said semiconductor body and are mutually separated by a layer of insulating material, the dielectric of the said capacitors and their lateral insulation being formed by means of islands and vertical partition walls, respectively, obtained by local anodic oxidation of the lower metal layer, which method is characterized in that, after deposition of the said lower metal layer and of the layer of insulating material covering it, through a first series of apertures provided in the said layer of insulating material, local recesses are provided in this metal layer in order to form therein cavities, in which the dielectric layers in the form of islands of the capacitors are then formed, and in that then through a second series of apertures provided in this same layer of insulating material new recesses are provided in the lower metal layer, in which the vertical partition walls are formed, thus giving the lower plates of the capacitors their ultimate form by insulating them simultaneously electrically from each other.

4,450,049

METHOD OF FORMING TANTALUM CAPACITOR ANODES AND MAKING THE CAPACITORS

Koreaki Nakata, Takarazuka; Jiro Ueno, and Yasuhiro Ogawa, both of Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Mar. 19, 1982, Ser. No. 359,837
Claims priority, application Japan, Mar. 19, 1981, 56-11198; Aug. 20, 1981, 56-131127
Int. Cl.³ C25D *5/44, 3/66, 11/00*
U.S. Cl. 204—35 N **3 Claims**



1. A method for making a solid tantalum electrolytic capacitor comprising:

anodizing a tantalum sintered body for substantial dielectric film growth in a substantially aqueous electrolyte;

anodically treating said anodized tantalum body in at least one fused salt selected from the group of nitrates of alkali metals, nitrates of alkaline earth metals and nitrites of alkali metals with an applied voltage which is as high as possible but within a range wherein capacitance-decrease of the anode formed in the aqueous electrolyte is not caused; and

anodically treating said fused salt-treated tantalum body in a substantially aqueous electrolyte with an applied voltage which is as high as possible but within a range wherein reanodization will not occur,

wherein the temperature of said fused salt is in the range of 250° C. to 350° C., and the concentration of alkaline oxide in said fused salt is less than 1.5×10^{-4} mol. per gram of said fused salt.

4,450,050

PROCESS FOR BONDING HIGH EFFICIENCY CHROMIUM ELECTRODEPOSITS

Hyman Chessin, Brick Township, Ocean County, and Edmund C. Knill, Tinton Falls, both of N.J., assignors to M&T Chemicals Inc., Woodbridge, N.J.

Filed Feb. 3, 1983, Ser. No. 463,465
Int. Cl.³ B01D *15/00*; C25D *3/04*
U.S. Cl. 204—41 **11 Claims**

1. A method of consistently forming an adherent chromium deposit on a metal substrate comprising the steps of:

(a) plating the substrate metal with iron or an iron alloy from

an iron salt containing bath for a time and at a current density sufficient to produce an adherent iron or iron alloy plating on the substrate metal;

(b) depositing chromium on the iron or iron alloy plated metal substrate from a chromic acid bath containing a halogen releasing compound selected from the group consisting of iodine releasing compounds, bromine releasing compounds and mixtures thereof and chromic acid for a time and at a current density sufficient to produce an aherent chromium plating.

4,450,051

BRIGHT NICKEL-IRON ALLOY ELECTROPLATING BATH AND PROCESS

Robert A. Tremmel, Woodhaven, Mich., assignor to OMI International Corporation, Warren, Mich.

Continuation-in-part of Ser. No. 224,773, Jan. 13, 1981, abandoned, and Ser. No. 224,774, Jan. 13, 1981, abandoned. This application Aug. 23, 1982, Ser. No. 410,685

Int. Cl.³ C25D *3/56*

U.S. Cl. 204—43 T **21 Claims**

1. An aqueous bath suitable for the electrodeposition of bright, high-leveling nickel-iron alloy deposits comprising nickel ions, iron ions, an iron solubilizing agent present in an amount to maintain the desired concentration of iron ions in solution, a buffering agent, a primary brightening agent present in an amount sufficient to produce a bright nickel-iron deposit, hydrogen ions to provide a pH of about 2.6 to about 4.5 and at least one bath soluble additive agent present in an amount of at least about 2 mg/l, selected from propargyl sulfonic acid, 1-butyne-3-sulfonic acid, 1-pentyne-5-sulfonic acid, 2-butyne-1-sulfonic acid and the alkali metal and ammonium salts thereof.

4,450,052

ZINC AND NICKEL TOLERANT TRIVALENT CHROMIUM PLATING BATHS

Warren H. McMullen, East Brunswick; Hyman Chessin, Brick Township, Ocean County, both of N.J., and Denise Siracusa, Staten Island, N.Y., assignors to M&T Chemicals Inc., Woodbridge, N.J.

Filed Jul. 28, 1982, Ser. No. 402,657

Int. Cl.³ C25D *3/06*

U.S. Cl. 204—51 **13 Claims**

1. In a trivalent chromium electroplating bath contaminated with zinc and/or nickel, the improvement comprising an effective amount to overcome contamination effects of a compound represented by the formula R-S, where:

S is selected from the group consisting of sulfinates, and the acids and soluble salts thereof, and

R is an aliphatic group having from 1 to 6 carbons, or an aromatic, alkyl aromatic or heterocyclic group having up to 12 carbons.

7. In a trivalent chromium electroplating bath contaminated with zinc and/or nickel, the improvement comprising an effective amount to overcome contamination effects of a compound represented by the formula R-S, where:

S is selected from the group consisting of vinyl sulfonate, allyl sulfonate, propargyl sulfonate and mixtures thereof; and

R is an aliphatic group having from 1 to 6 carbons, or an aromatic, alkyl aromatic or heterocyclic group having up to 12 carbons.

4,450,053

DEVICE FOR FEEDING ELECTROLYTIC CELLS AND METHOD OF OPERATING THE SAID DEVICE

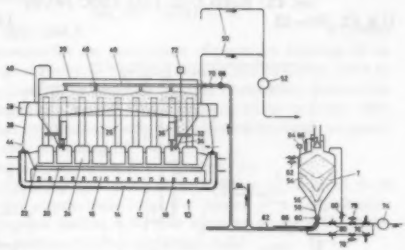
Walter Merz, Küsnacht, and Hans Friedli, Steg, both of Switzerland, assignors to Swiss Aluminium Ltd., Chippis, Switzerland

Filed Aug. 13, 1980, Ser. No. 177,729

Claims priority, application Switzerland, Aug. 28, 1979, 7854/79

Int. Cl.³ C25C *3/14*

U.S. Cl. 204—67 **16 Claims**



1. A device for the automatic controlled feeding of an alumina mixture to an electrolytic cell used in the production of aluminum comprising:

at least one electrolytic cell;

an alumina mixture storage bunker positioned above said at least one electrolytic cell, said alumina mixture storage bunker being provided with means for feeding an alumina mixture to said at least one electrolytic cell;

a pressure chamber, said pressure chamber being provided with means for charging said pressure chamber with the alumina mixtures;

a feed system for transporting the alumina mixture from said pressure chamber to said alumina mixture storage bunker by means of compressed air, said feed system comprising an elongated material feed pipe, a plurality of compressed air inlet means provided over the entire length of said elongated material feed pipe, and means associated with said plurality of compressed air inlet means for equalizing the amount of compressed air entering said elongated material feed pipe over the entire length thereof; and

sensing means in said alumina mixture storage bunker for sensing the level of the alumina mixture for charging said pressure chamber in response to said sensed condition and feeding the alumina mixture from said pressure chamber to said alumina mixture storage bunker.

4,450,054

ALUMINA REDUCTION CELL

Alton T. Tabereaux, Sheffield, Ala., assignor to Reynolds Metals Company, Richmond, Va.

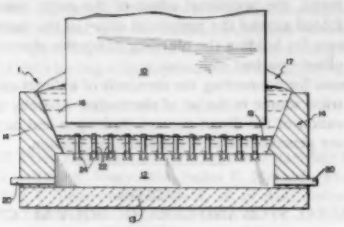
Filed Sep. 28, 1983, Ser. No. 536,707

Int. Cl.³ C25C *3/06, 3/08, 11/12*

U.S. Cl. 204—67 **5 Claims**

1. In an alumina reduction cell having an anode, a carbonaceous cathode forming the floor of said cell and a plurality of refractory hard metal (RHM) shapes extending vertically upwardly from said carbonaceous cathode the improvement comprising inert refractory sleeves imbedded in said carbonaceous cathode, said RHM shapes being mounted within said

sleeves without being affixed thereto to thereby eliminate any RHM-carbonaceous material interface and to permit removal



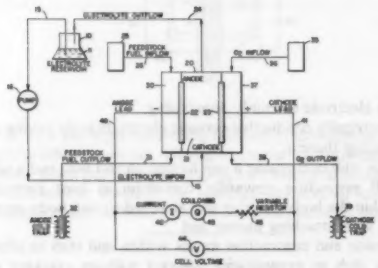
and replacement of said RHM shapes during operation of said cell.

4,450,055

ELECTROGENERATIVE PARTIAL OXIDATION OF ORGANIC COMPOUNDS

Gery R. Stafford, Warren, N.J., assignor to Celanese Corporation, New York, N.Y.

Filed Mar. 30, 1983, Ser. No. 480,441
Int. Cl.³ C25B *3/02*
U.S. Cl. 204—78 **12 Claims**



1. A continuous electrochemical process for partial oxidation of organic compounds which comprises contacting a palladium anode with a methyl-substituted hydrocarbon in a fuel cell containing an acidic aqueous electrolyte at a temperature between about 40°–200° C. to form corresponding aldehyde and carboxylic acid products, wherein the electrogenerative current density is in the range between about 0.5–20 milliamperes per square centimeter at a resistive load of 1–150 ohms, the anodic potential is controlled at a selected level in the range between about 0–0.55 volts with reference to a saturated calomel electrode, and the molar selectivity of methyl-substituted hydrocarbon conversion to aldehyde and carboxylic acid is at least about 80 percent, and wherein the oxidation occurs at the methyl-substituent of the hydrocarbon starting material.

4,450,056

RANEY ALLOY COATED CATHODE FOR CHLOR-ALKALI CELLS

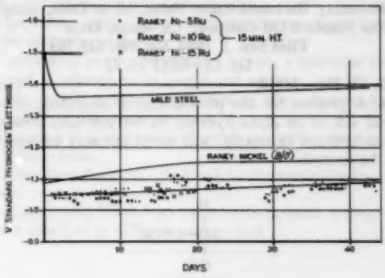
Thomas J. Gray, Guilford, Conn., assignor to Olin Corporation, New Haven, Conn.

Division of Ser. No. 324,188, Nov. 23, 1981, Pat. No. 4,419,208. This application Mar. 28, 1983, Ser. No. 479,588
Int. Cl.³ C25B *11/08*; B01J *35/00*
U.S. Cl. 204—98 **29 Claims**

1. A method of producing a low overvoltage electrode for use as a hydrogen evolution cathode in an electrolytic cell which comprises the steps of:

(a) coating with aluminum the surface of a clean non-porous conductive base metal structure, said surface comprising a nickel-ruthenium alloy having a weight percent ruthenium within the range of from 5 to about 15 and a weight percent nickel within the range of from about 95 to about 85;

(b) heat treating said coated surface by maintaining said surface at a temperature within the range of from about 660° to about 750° C. for a time from about 1 minute to about 30 minutes to interdiffuse a portion of said aluminum into the outer portions of said surface to produce an integral nickel-ruthenium-aluminum Beta structured ternary alloy layer in said outer portions consisting predominantly of Beta structured grains and further having an inner portion consisting predominantly of Gamma structured grains in said alloy layer; and



(c) leaching out the residual aluminum and intermetallics from said interdiffused alloy layer until a Raney nickel ruthenium layer is formed integral with said structure.

4,450,057

PROCESS FOR REMOVING ALUMINUM AND SILICA FROM ALKALI METAL HALIDE BRINE SOLUTIONS

Pilar P. Kelly, Knoxville, Tenn., assignor to OLIN Corporation, New Haven, Conn.

Filed Nov. 18, 1983, Ser. No. 552,958
Int. Cl.³ C25B *1/16, 1/26*
U.S. Cl. 204—98 **14 Claims**

1. In a process for purifying an alkali metal halide brine anolyte for an electrolytic cell, wherein the pH of said brine is raised so as to substantially remove dissolved calcium and magnesium therefrom, the improvement comprising:

(a) adjusting the pH of said purified brine to between about 2.0 and about 3.0;

(b) contacting said brine with a strong macroreticular cationic chelating resin to remove dissolved aluminum and silica therefrom, said contact causing the pH of said brine to increase and continuing the contacting of said brine with said resin for as long as the pH of the brine on discharge is above about 5.5; and

(c) separating said brine from said resin for use in said cell.

4,450,058

METHOD FOR PRODUCING BRIGHT STAINLESS STEEL

Paul T. Lovejoy, Verona, Pa., assignor to Allegheny Ludlum Steel Corporation, Pittsburgh, Pa.

Filed Jul. 29, 1983, Ser. No. 518,500
Int. Cl.³ C25F *1/06*
U.S. Cl. 204—145 R **8 Claims**

1. A method for processing stainless steel strip after cold rolling to produce a scale-free, bright surface, said method comprising continuously annealing said strip in air, then descaling said annealed strip by making said annealed strip an

anode and applying electric current to said strip with said strip in an electrolyte consisting essentially of an aqueous solution of at least one neutral salt selected from the group consisting of chloride, sulfate and nitrate of an alkali metal including ammonium with the pH of said electrolyte being maintained between 1 and 7.

4,450,059

PHOTOCHEMICAL DECARBOXYLATION OF A METAL SALT OF AN ALPHA-HYDROXY CARBOXYLIC ACID

Abolghassem Eskamani, Aurora; Helen D. Dernar, Parma, and Rosemary Bartoszek-Loza, Solon, all of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Filed Sep. 2, 1983, Ser. No. 528,763
Int. Cl.³ B01J *19/12*
U.S. Cl. 204—158 R **12 Claims**

1. A process for the photochemical decarboxylation of a metal salt of an alpha-hydroxy carboxylic acid wherein the alpha-hydroxy carboxylic acid metal salt may be represented by the formula:

wherein;

R is hydrogen or an alkyl, alkenyl, aryl, alkaryl, cycloalkyl or cycloalkenyl having 1 to about 20 carbon atoms; and

M is a metal selected from the group consisting of Group IB, IIB, IIIB, IVB, VB, VIB, VIIB, and VIIIB elements, Ce, Al, Ca, Mg and Sn;

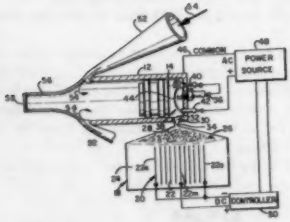
and wherein said alpha-hydroxy carboxylic acid metal salt is present in an aqueous solution at a concentration of from about 0.01 percent to about 50 percent by weight based on the total weight of the solution, and is exposed to light at a temperature between about 0° C. and about 100° C. in the absence of a photosensitizing agent.

4,450,060

BIPOLAR ELECTROLYTIC CELL

Ernesto Gonzalez, c/o Howard, Brawner & Lovett, 131 Dade Savings Bldg., 119 E. Flagler St., Miami, Fla. 33131

Division of Ser. No. 207,938, Nov. 18, 1980, Pat. No. 4,332,219. This application Dec. 3, 1981, Ser. No. 327,187
Int. Cl.³ C25B *9/00, 11/02, 11/10, 1/06*
U.S. Cl. 204—268 **7 Claims**



1. An electrolytic cell for separating hydrogen and oxygen gases from water, comprising:

a sealed container, having a vent for withdrawing the hydrogen and oxygen gases;

a charge of water disposed in the container;

a charge of bicarbonate of soda dissolved in the water, forming an electrolytic solution;

at least one set of a plurality of bipolar electrodes spaced from one another but otherwise, disposed in a closely packed row and substantially immersed in the electrolytic solution, each of the bipolar electrodes being a lamination of a flat inner member formed from a sheet of a first metal and a flat outer member formed from a sheet of a second metal, the peripheral edges of the outer member being folded around the peripheral edges of the inner member;

means for holding the plurality of bipolar electrodes in the closely packed row; and,

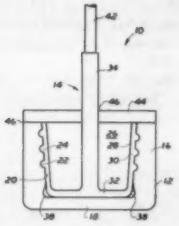
means for connecting the terminals of a direct current electrical source to the set of electrodes, whereby upon application of the direct current, hydrogen and oxygen gases are generated in stoichiometric proportion.

4,450,061

METAL STUB AND CERAMIC BODY ELECTRODE ASSEMBLY

Richard L. Rolf, New Kensington, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa.

Filed Dec. 20, 1982, Ser. No. 451,068
Int. Cl.³ C25C *7/02*; C25B *11/04*; C25D *17/12*
U.S. Cl. 204—286 **7 Claims**



1. An electrode assembly comprising:

an electrically conductive ceramic electrode body having an opening therein;

a metal stub comprising a cup having an end wall and a side wall projecting upwardly therefrom at least partially within the body opening and attached to said body opening with attaching means; and

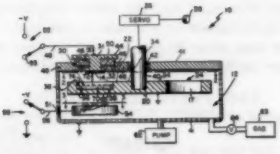
expansion and contraction means within said stub to allow said stub to expand and contract without cracking or otherwise fracturing said body.

4,450,062

SPUTTERING APPARATUS AND METHODS

Alexander Macaulay, Cupertino, Calif., assignor to Raytheon Company, Lexington, Mass.

Division of Ser. No. 333,532, Dec. 22, 1981, Pat. No. 4,410,407. This application Aug. 5, 1983, Ser. No. 520,407
Int. Cl.³ C23C *15/00*
U.S. Cl. 204—298 **1 Claim**



1. Sputtering apparatus, comprising:

(a) means, including an ionization chamber, for producing ions in the ionization chamber;

(b) means, disposed within the ionization chamber, for supporting a target material;

(c) means, disposed within the chamber, for supporting an

object to be deposited with particles ejected from the target material by bombardment of such target material with the ions produced within the ionization chamber; and

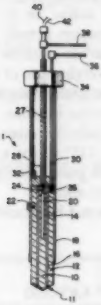
(d) a shield, disposed in the ionization chamber between the target supporting means and the object supporting means, such shield having a lip disposed about the object supporting means.

4,450,063

PROBE FOR ALUMINA CONCENTRATION METER

Thomas J. Johnston, Rogersville; Nolan E. Richards, Florence, and Alton T. Tabereaux, Sheffield, all of Ala., assignors to Reynolds Metals Company, Richmond, Va.

Filed Sep. 28, 1983, Ser. No. 536,708
Int. Cl.³ G01N *27/26*
U.S. Cl. 204—400 **10 Claims**



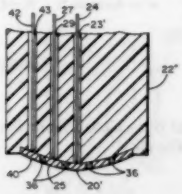
1. In a probe for measuring alumina concentration in a bath comprising an anode, electrical insulation surrounding said anode and a cathode surrounding said electrical insulation, the improvement wherein the working surfaces of said anode, insulation and cathode lie on a common, inclined surface.

4,450,064

ELECTROCHEMICAL GAS SENSOR AND METHOD FOR PRODUCING THE SAME

John N. Harman, III, Placentia, Calif., assignor to Beckman Instruments, Inc., Fullerton, Calif.

Filed Mar. 21, 1983, Ser. No. 477,098
Int. Cl.³ G01N *27/46*
U.S. Cl. 204—412 **14 Claims**



1. An improved method for producing an electrode assembly that includes a plurality of electrodes comprising:

(a) forming an electrically nonconductive mounting member having a plurality of conductor routing holes,

(b) forming an electrode blank from an electrically conductive material,

(c) attaching a plurality of conductors to predetermined points on one surface of the electrode blank,

(d) passing said conductors through respective ones of said conductor routing holes,

(e) attaching the electrode blank to the mounting member, and

(f) cutting away sections of the electrode blank to partition the same into electrically isolated regions that are attached to different respective conductors.

7. An improved electrochemical gas sensor of the type having a gas permeable membrane, a housing defining an electrolyte chamber for receiving an electrolyte solution, and a mounting member for mounting a plurality of electrodes in the electrolyte chamber in the vicinity of the gas permeable membrane, said gas sensor being produced by:

(a) providing a plurality of conductor routing holes through the mounting member,

(b) providing an electrode blank having a thickness that is small in relation to its length and width,

(c) electrically connecting a plurality of conductors to one surface of the electrode blank,

(d) passing the conductors through respective ones of said routing holes,

(e) attaching the electrode blank to the mounting member, and

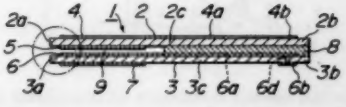
(f) cutting said blank into electrically isolated regions that are attached to different conductors.

4,450,065

OXYGEN SENSOR

Tetsuyo Yamada, and Yutaka Nakayama, both of Nagoya, Japan, assignors to NGK Spark Plug Co., Ltd., Nagoya, Japan

Filed Jul. 26, 1982, Ser. No. 402,071
Claims priority, application Japan, Mar. 9, 1982, 57-36973
Int. Cl.³ G01N *27/58*
U.S. Cl. 204—412 **9 Claims**



1. An oxygen sensor, comprising an oxygen pump element having a first oxygen-ion-conductive solid electrolyte board with electrode layers attached to opposite surfaces at one end of the first board, an oxygen concentration cell element having a second oxygen-ion-conductive solid electrolyte board with electrode layers attached to opposite surfaces at one end of the second board, and a means for coupling said oxygen pump element and said oxygen concentration cell element in parallel to each other with a gap between the electrode layers attached to the opposing surfaces of the first board and the second board, the edges of said gap being open to the surrounding atmosphere along at least three sides thereof, whereby said oxygen concentration cell element generates electromotive force caused by the difference between oxygen concentration in said gap and oxygen concentration of a gas surrounding the outside of the oxygen sensor while said oxygen pump element performs oxygen transportation therethrough from said gap to the outside of the oxygen sensor or vice versa to cause said oxygen concentration difference therebetween.

4,450,066

HYDROTHERMAL PRETREATMENT TO PREVENT SCALE DURING LIQUEFACTION OF CERTAIN SOLID CARBONACEOUS MATERIALS

John B. Stone, Houston, and Frank M. Floyd, Baytown, both of Tex., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Continuation of Ser. No. 183,479, Sep. 2, 1980, abandoned. This application Nov. 8, 1982, Ser. No. 440,062
Int. Cl.³ C10G *1/00*
U.S. Cl. 208—8 LE **7 Claims**

1. A process for the liquefaction of a lower ranking coal or

similar solid carbonaceous material containing from about 20 to about 40 weight percent moisture consisting essentially of the steps of:

(a) hydrothermally pretreating said coal or carbonaceous material by heating the coal or solid carbonaceous material to a temperature within the range from about 500° to about 700° F. at a total pressure at least 10% above the vapor pressure of water at the pretreating temperature to reduce the amount of alkaline earth metal humates therein;

(b) liquefying the thus treated coal at liquefaction conditions to produce a petroleum-like product; and

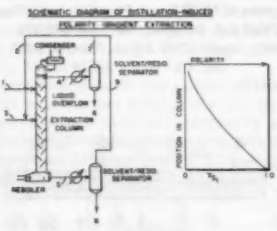
(c) recovering the liquid product from the unliquefied portion of the pretreated coal or similar carbonaceous material.

4,450,067

DISTILLATION-INDUCED EXTRACTION PROCESS

Philip J. Angevine, West Deptford; Michael B. Carroll, Mantua; Stuart S. Shih, Cherry Hill, and Samuel A. Tabak, Wenonah, all of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Apr. 30, 1981, Ser. No. 259,113
Int. Cl.³ C10G *21/02*; C10C *3/08*
U.S. Cl. 208—86 **7 Claims**



1. An improved method of producing low CCR maltenic fractions and high CCR asphaltenic fractions from hydrocarbonaceous residua and other heavy oils by multisolvent-distillation-induced polarity gradient extraction comprising contacting two or more suitable solvents with said residua in a liquid flooded distillation column operating in a liquid continuous mode, said solvents having a high and a low boiling point with respect to one another, said higher boiling solvent having a higher relative polarity than said lower boiling solvent and each of said boiling points being sufficiently lower than that of the residua so that the solvents are distillted into high and low polarity fractions thereby forming a low CCR maltenic overhead stream and a high CCR asphaltenic bottoms stream and thereafter recovering the solvents from the overhead stream and the bottoms stream, and recycling the solvents for reuse.

4,450,068

DEMETALLIZATION OF HYDROCARBON CONTAINING FEED STREAMS

Semyon Kukes, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Dec. 20, 1982, Ser. No. 451,292
Int. Cl.³ C10G *45/00*; B01J *27/14*
U.S. Cl. 208—251 H **17 Claims**

1. A process for the demetallization of a hydrocarbon containing feed stream, which contains metals, comprising the step of contacting said hydrocarbon containing feed stream under suitable demetallization conditions with hydrogen and a catalyst composition comprising zirconium phosphate and a metal phosphate where the metal is selected from the group consisting of nickel, iron, vanadium and cobalt.

4,450,069

METHOD FOR UPGRADING DIENE-CONTAINING HYDROCARBON MIXTURES

Louis E. Kidwell, Jr., and Dysart E. Holcomb, both of Shreveport, La., assignors to Pennzoil Company, Houston, Tex.

Continuation-in-part of Ser. No. 116,863, Jan. 30, 1980, Pat. No. 4,302,255. This application Sep. 8, 1981, Ser. No. 300,450
The portion of the term of this patent subsequent to Nov. 24, 1998, has been disclaimed.
Int. Cl.³ C10G *29/02*; C07C *7/177*
U.S. Cl. 208—255 **7 Claims**

1. A method for the upgrading of by-product hydrocarbon mixtures to reduce their content of gum precursors, the process comprising:

(a) obtaining a hydrocarbon mixture containing about 60–90 wt.% of aromatic components, about 3–40 wt.% of dienes and pseudodienes, and up to about 6 wt.% of relatively unreactive organic compounds;

(b) raising elemental sulfur to a temperature of about 115°–135° C. in a reaction vessel;

(c) adding said hydrocarbon mixture to said elemental sulfur in the approximate weight ratio of about 5–95 wt.% of the hydrocarbon mixture with about 95–5 wt.% of elemental sulfur to form a reaction mixture;

(d) maintaining said reaction mixture at the temperature range of about 115°–135° C. for a time period of 10 minutes to 24 hours, with good mixing of said sulfur and said hydrocarbon mixture; and

(e) removing the unreacted hydrocarbon materials by distillation.

4,450,070

IMIDAZOLINE CONDITIONER FOR THE FLOTATION OF OXIDIZED COAL

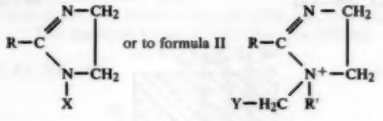
Robert E. Hefner, Jr., Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed Nov. 13, 1981, Ser. No. 320,989
Int. Cl.³ B03B *1/00*
U.S. Cl. 209—3 **5 Claims**

1. A froth flotation process for beneficiating coal having an oxidized surface which comprises the steps of:

(a) classifying the coal to separate particles of flotation size; and

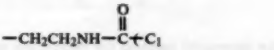
(b) floating the sized coal in a frothing aqueous medium comprising a fuel oil collector and an effective amount of a compound corresponding to the formula



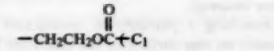
wherein

R in formula I and II is a C_6 to C_{22} alkyl or C_6 to C_{22} alkenyl;

X is —H, C_1 to C_{22} alkyl,



to C_{22} alkyl, C_2 to C_{22} alkenyl or —H), $—CH_2CH_2NH_2$, $—CH_2CH_2OH$,



to C_{22} alkyl, C_2 to C_{22} alkenyl or —H),

$$-CH_2CH_2OCHCH-OH, \quad (\text{each CH bearing } Q)$$

each Q being independently —H or —CH_3, or

$$-CH_2CH_2O(CH_2)_tC(=O)-O \leftarrow C_1$$

to C_{22} alkyl, C_2 to C_{22} alkenyl or —H), t being an integer 1 to 2;

Y is —H, C_1 to C_{21} alkyl, —CH_2OH,

$$-CH_2OC(=O) \leftarrow C_1$$

to C_{22} alkyl, C_2 to C_{22} alkenyl) or

$$-CH_2CH_2OCHCH-OH, \quad (\text{each CH bearing } Q)$$

each Q being independently —H or —CH_3; and

R' is

$$-CH_2-C(=O)-O^{\ominus} \text{ or } -CH_2-CH(M)-CH_2-SO_3^{\ominus},$$

M being —H, —OH or

$$-O-C(=O) \leftarrow H,$$

C_1 to C_{22} alkyl or C_2 to C_{22} alkenyl).

4,450,071

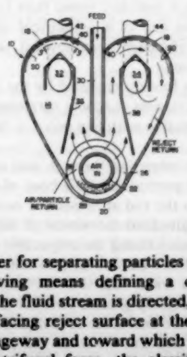
ADJUSTABLE PARTICLE CLASSIFIER

Norman K. Trozzi, West Caldwell, N.J., assignor to Foster Wheeler Energy Corporation, Livingston, N.J.

Filed Jul. 9, 1982, Ser. No. 396,944

Int. Cl.[3] B04C *5/103*

U.S. Cl. 209—144 **13 Claims**



1. In a classifier for separating particles suspended in a fluid stream and having means defining a curved passageway through which the fluid stream is directed, such means including a inwardly facing reject surface at the outer boundary of the curved passageway and toward which surface particles are directed by centrifugal force, the classifier also having an outlet for accepted particles remaining in the stream throughout the length of said curved passageway, the improvement comprising:

- **a plurality of spaced, generally parallel fingers extending along the inner surface of said curved passageway in the direction of fluid stream flow and having leading and trailing ends in relation to said direction of fluid flow;**
- **means to pivotally support said fingers at the leading ends thereof; and**
- **means for selectively pivoting said fingers to and from a projected position in which their trailing end portions project into said fluid stream.**

4,450,072

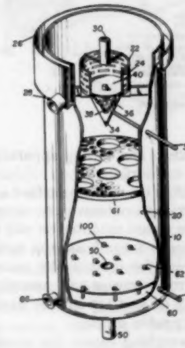
AIR FLOTATION CELL

John C. Suplicki, 1813 Michelle La., Lakeland, Fla. 33803

Filed Nov. 17, 1982, Ser. No. 442,299

Int. Cl.[3] B03D *1/24*

U.S. Cl. 209—170 **12 Claims**



1. Air flotation cell for separation of floatable and non-floatable particles from an aqueous pulp feed by froth flotation comprising,

(a) an air flotation chamber to receive said aqueous pulp,

(b) pulp feed means for introducing aqueous pulp feed into said flotation chamber,

(c) froth overflow means disposed adjacent to the upper end of the flotation chamber for discharging therefrom particles of said aqueous pulp,

(d) a plenum chamber disposed adjacent to the bottom of the floation chamber, said plenum chamber being adapted to contain an upper layer of air and a bottom layer of water,

(e) a substantially horizontal flotation chamber floor plate disposed between said flotation chamber and said plenum chamber,

(f) means for introducing air and water into said plenum chamber,

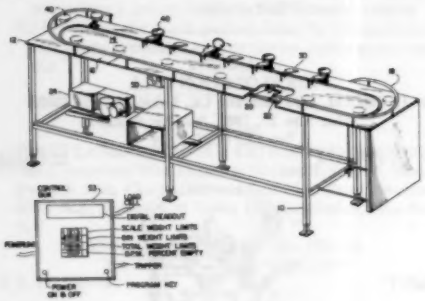
(g) underflow means for discharging a non-float fraction containing unfloated particles of said aqueous pulp from said flotation chamber, said underflow means including a discharge duct which opens through said flotation chamber floor plate,

(h) a plurality of static shear tubes for aerating water extending through said flotation chamber floor plate and connecting said plenum chamber with said flotation chamber wherein said static shear tubes conduct air and water from said plenum chamber into said flotation chamber, and wherein said static shear tube comprises a tube having two ends and an enclosed wall disposed between said two ends, one of said ends being open and the other end having a partially open distribution cap thereon, a static shear element inside the tube adjacent the end having the distribution cap, and at least one open inlet slot in said wall.

4,450,073
AUTOMATIC WEIGHT GRADING AND SORTING APPARATUS

C. H. Burnett, deceased, late of Gainesville, Ga., and by Betty L. C. Burnett, administrator, Rte. #12, Box 489, Newton Dr., Gainesville, Hall Co., Ga. 30501

Filed Dec. 24, 1981, Ser. No. 334,177
Int. Cl.³ B07C 5/28; G01G 13/14
U.S. Cl. 209—564 15 Claims



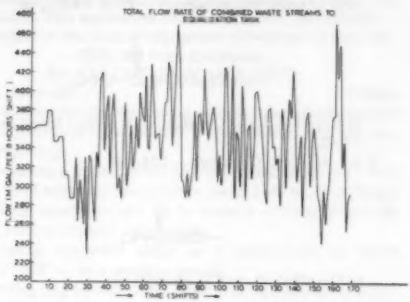
1. A weight grading and sorting apparatus comprising:
a base having a top surface;
trolley means riding on said top surface and having tippable means for carrying contents to be weighed and sorted;
endless conveyor means mounted on said base for conveying said trolley means around said top surface;
means in said base for individually successively weighing each of said trolley means and contents;
tare means riding on said top surface having a weight equal to an empty tippable means;
means in said weighing means for zeroing said weighing means;
means associated with said conveyor means for signalling to said weighing means and said tipping means that said tare means is present on said weighing means; and
means associated with said means for weighing for selectively tipping each means for carrying at a predetermined position, remote from said means for weighing, based on the weight of said contents.

4,450,074
CONTROL OF ANAEROBIC FILTER

Shinya Ochiai, Corpus Christi, Tex., assignor to Celanese Corporation, New York, N.Y.

Continuation of Ser. No. 209,813, Nov. 24, 1980, Pat. No. 4,349,435. This application Aug. 13, 1982, Ser. No. 408,088
The portion of the term of this patent subsequent to Sep. 14, 1999, has been disclaimed.
Int. Cl.³ C02C 1/02
U.S. Cl. 210—96.1 12 Claims

7. An anaerobic reactor system comprising
a recycling anaerobic filter for converting organic compounds in an aqueous watewater stream into methane and carbon dioxide by the action of methanogenic bacteria in said anaerobic filter,
means for feeding said aqueous organic wastewater stream to said anaerobic filter,
means for withdrawing an aqueous liquid effluent stream from said anaerobic filter,
means for withdrawing a gaseous stream comprising methane from said anaerobic filter,
means for measuring the rate at which oxygen demand is fed to said anaerobic filter in said waste stream and for generating a signal which is representative of said measured feed oxygen demand,
means for measuring the rate of flow of methane in said gaseous stream and for generating a signal representative of said measured methane flow rate,
an estimating filter, receiving said signals, for estimating the oxygen demand in said effluent stream and for generating

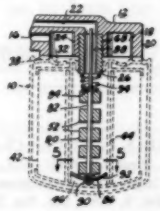


a signal representative of said estimated effluent oxygen demand, and
means, responsive to said signal for estimated effluent oxygen demand, for controlling the rate at which said aqueous organic waste stream is fed to said anaerobic filter.

4,450,075
MAGNETIC OIL FILTER INSERT

Cecil J. Krow, P.O. Box 249, Ralston, Okla. 74650

Filed Apr. 28, 1983, Ser. No. 489,449
Int. Cl.³ B01D 35/06
U.S. Cl. 210—223 2 Claims



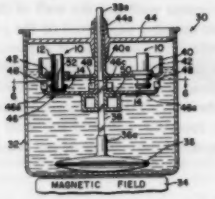
1. In an engine oil filter system having an oil filter support head provided with a centrally bored boss for coaxial sealing connection with one end of a cylindrical oil filter having a central cylindrical chamber open toward said boss, the improvement comprising:
an elongated tube loosely received by the filter chamber;
a plurality of permanent magnets surrounding said tube in spaced-apart relation with like poles of the magnets juxtaposed;
an elongated rod extending through said tube and projecting, at one end portion, into the bore of said boss;
fastener means on the rod at respective ends of the tube for preventing longitudinal movement of said rod relative to said tube and maintaining the respective endmost magnet on the adjacent end portion of said tube; and,
a spring having a width less than its length and having a length at least slightly greater than the inside diameter of the filter chamber and secured medially its ends by said fastener means adjacent the other end portion of said rod for centering the adjacent end of said tube in the filter chamber.

4,450,076

SMALL-SAMPLE DIALYZER

Gustav K. Medicus, and Rudolf G. Medicus, both of 7521 W. Hyland Dr., Dayton, Ohio 45424

Filed Aug. 20, 1982, Ser. No. 409,881
Int. Cl.³ B01D *31/00*
U.S. Cl. 210—242.1 **1 Claim**



1. A small-sample dialyzer comprising:

(a) a plurality of dialysis cells for holding fluid samples, each comprising: a circular elongated tube open at both ends, a dialysis membrane covering one open end of said tube, and a retaining ring for holding said membrane in position on said tube;

(b) a plurality of magnetic balls for placing within said dialysis cells;

(c) a substantially flat bottomed open top container of non-magnetic material for holding a liquid into which an ingredient in said fluid samples is to dialyze;

(d) a plurality of seal rings longitudinally adjustable and surrounding the tube on each of said dialysis cells;

(e) a circular dished cell holding tray for floating on the liquid in said container and having a coaxial elongated upward extending circular hub containing a coaxial circular bore through said holding tray, and further having a plurality of apertures in the bottom of said circular holding tray coaxially spaced about the circular bore through said holding tray, said apertures receiving in firm resilient engagement said seal rings on each of said dialysis cells and vertically positioning said dialysis cells containing said magnetic balls with the membrane on said dialysis cells in contact with the liquid in said container;

(f) an agitator having two opposing long arms horizontally extending from a central hub and extending beyond the outer extremity of said dialysis cells mounted in said holding tray, and two opposing short arms horizontally extending from said central hub at substantially right angles to said long arms and of a length short of the inner extremity of said dialysis cells mounted in said holding tray, each of said arms supporting a permanent magnet at the outer extremity of said arms, said central hub extending upward from said arms and abutting against the lower side of said holding tray for establishing a predetermined vertical distance between said holding tray and said agitator arms within which vertical distance the lower ends of said dialysis cells are to be positioned, said central hub further having a vertical square aperture therethrough;

(g) a driving permanent magnet sheathed in plastic having an upward extending hub with a vertical socket therein of square cross-section, said magnet being in the bottom of said container for rotation by an external rotating magnetic field;

(h) an elongated drive shaft having a lower end of square cross-section for engaging the socket in said driving magnet and extending upward through the square aperture in the hub of said agitator for rotating said agitator with the magnets on the arms of said agitator moving said magnetic balls to-and-fro in said dialysis cells, said drive shaft further having a circular upper end rotationally extending through the circular bore in said cell holding tray; and,

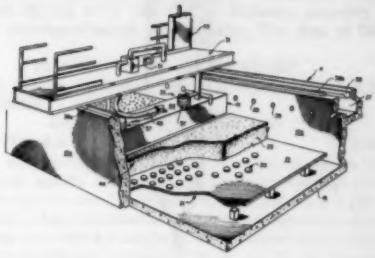
(i) a guide member supported by the open end of said container, said guide member having a vertically extending hub having a longitudinal bore therethrough for rotationally receiving the hub on said holding tray.

4,450,077

GRANULAR MEDIA FILTER

Brent C. Black; Bruce D. Bradley, and Ralph B. Haymore, all of Salt Lake City, Utah, assignors to Envirotech Corporation, Salt Lake City, Utah

Filed Aug. 6, 1982, Ser. No. 405,813
Int. Cl.³ B01D *23/24*
U.S. Cl. 210—275 **9 Claims**



1. A filtering machine comprising:

(a) an open, liquid-holding tank;

(b) a bed of granular filter media which is contained in said tank;

(c) means mounted with said tank for supporting the bed of granular filter media while permitting passage of filtrate through the bed from below;

(d) means for distributing influent liquid containing suspended solids across the upper surface of the bed for percolation downward therethrough;

(e) a partitioning means mounted on said tank and a carriage mechanism to selectively convey said partitioning means across the upper surface of the bed, said partitioning means including a partitioning chamber selectively insertable into the bed to isolate one section from the remainder of the bed; and

(f) means to selectively allow insertion of said partitioning chamber into the bed and removal of said partitioning chamber from the bed;

(g) pump means in communication with the interior of said partitioning chamber to draw liquid through the bed within the isolated section to backwash the isolated section while filtration proceeds in the remainder of the bed.

4,450,078

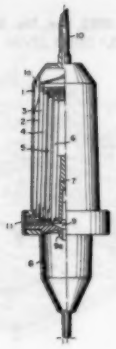
MICROFILTRATION DEVICE FOR THE FILTRATION OF COAGULA AND MICROAGGREGATES FROM BLOOD

Wolfram H. Walker, Rödermark; Karl H. Gänshirt, Dreieich, and Hans Schleussner, Frankfurt, all of Fed. Rep. of Germany, assignors to Biotest-Serum-Institut GmbH, Frankfurt-Niederrad, Fed. Rep. of Germany

Filed Sep. 29, 1982, Ser. No. 427,234
Claims priority, application Fed. Rep. of Germany, Nov. 14, 1981, 31453201
Int. Cl.³ B01D *25/04, 39/16*
U.S. Cl. 210—315 **4 Claims**

1. In a microfiltration device for the filtration of coagula and microaggregates from blood and blood components, comprising a hermetically sealable casing having an attaching nozzle and an outlet, a filter cone with a series of truncoconical filter elements within said casing, the elements from the outermost inwardly having filtering surfaces of successively diminishing pore size and surface area, and a piece provided with an open-

ing separating the inside of the casing into a filter chamber in which the filter cone is located and a drip chamber, the improvement wherein the filter chamber and filter cone have different angles of inclination, the inclination of the filter cone from the inlet to the outlet being greater than the inclination of the filter chamber, and the distance between filter cone and filter chamber amounting to no more than about 3 mm, the filter cone has from two to four filter elements and has a spacer



extending into the filter element with the smallest pore size and the smallest surface area and supporting same, and each of the filter elements is equipped with at least two substantially opposite ribs running from the base to the apex of the truncated cone, which extend no more than 3 mm into the interior of the truncated cone, and the spacer is so constructed that it serves simultaneously as support for the ribs and as support of the filter surface of the filter element, the device having a capacity of less than about 100 ml.

4,450,079

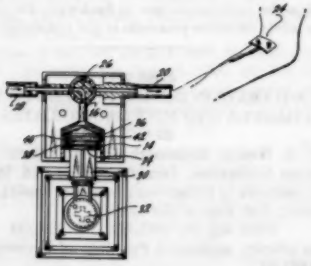
CASSETTE FOR PROVIDING A CONTROLLED FLOW OF FLUID

Andrew F. Farr, Spring Valley, Calif., assignor to IMED Corporation, San Diego, Calif.

Continuation of Ser. No. 073,097, Sep. 6, 1979, abandoned. This application Nov. 12, 1981, Ser. No. 320,192

Int. Cl.³ A61M *5/00*

U.S. Cl. 604—152 **20 Claims**



1. In combination in a vertically disposed cassette for providing a controlled flow of fluid between a source and a patient,

a chamber having a wall defining a substantially constant cross sectional area,

a piston member disposed in the chamber and reciprocable in a first substantially downward direction for receiving the fluid into the chamber and reciprocable in an opposite substantially upward direction for transferring fluid from the chamber,

plunger means at the end of the piston member and including a recessed wall and a land at the end of the recessed wall for engaging the chamber during the reciprocation of the piston member in the upward and downward directions, the land being disposed at the leading end of the recess in the movement of the plunger means in the downward direction, there being a lubricating fluid in the space between the recessed wall and the wall of the chamber, and

a porous washer member supported on the piston member at a position below the land and at a position slightly displaced from the bottom end of the land, there being a lubricating fluid in the pores of the washer member for facilitating the flow of the lubricating fluid into the space between the recessed wall and the wall of the chamber during the upward movement of the washer member.

4,450,080

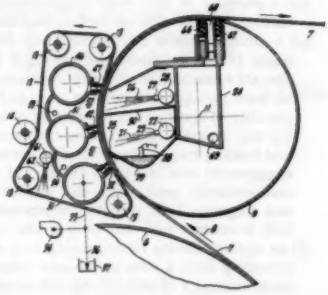
APPARATUS FOR REMOVING EXCESS LIQUID AND CONTAMINANTS FROM BELT FILTER CAKE

Joseph C. Dodd, 6745 Alisal St., Pleasanton, Calif. 94566

Filed Sep. 28, 1982, Ser. No. 425,323

Int. Cl.³ B01D *33/04, 33/36*

U.S. Cl. 210—391 **8 Claims**



1. An apparatus for removing excess liquid from filter cake solids comprising a filtration drum rotatable in one direction about an axis, a perforated separation drum arranged adjacent to said filtration drum and simultaneously rotatable in the opposite direction about a parallel axis, a main perforated belt having an inside surface on which said cake is deposited and having an outside surface and disposed with said outside surface engaging said filtration drum and with said inside surface engaging said separation drum, an anti-wear belt having an outside surface and an inside surface, means for mounting said anti-wear belt in a closed loop having one portion with said outside surface of said anti-wear belt in contact with said outside surface of said main belt in a predetermined portion of said main belt lying against said separation drum, a main suction box within said separation drum and having an inlet in substantial communication with the interior surface of said separation drum in a zone of said separation drum contacted by said main belt, at least one suction header with a suction slot defined by seals disposed in substantial contact with said inside surface of said anti-wear belt in said one portion thereof and means within said separation drum for directing wash liquid toward the interior surface of said separation drum in said one portion thereof exteriorly contacted by said anti-wear belt.

4,450,081

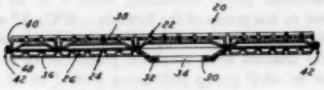
TRANSMISSION FLUID FILTER AND METHOD OF MANUFACTURE

David L. Anderson, Muskegon, Mich.; Robert F. Hitchcock, Glendale Hts., and Robert M. Tamburrino, Chicago, both of Ill., assignors to Sealed Power Corporation, Muskegon, Mich.

Filed Jul. 16, 1981, Ser. No. 284,078

Int. Cl.³ F01M *11/03*

U.S. Cl. 210—445 15 Claims



1. In a transmission fluid filter comprising a first member of plastic construction, a second member of sheet metal construction, means about the periphery of said first and second members fastening said members to each other to form an internal fluid cavity and filter means carried by said members for filtering fluid during passage through said cavity, the improvement wherein said fastening means about the periphery of said first and second members comprises a bead integrally extending around the periphery of said first member, said bead having an arcuate surface facing in a direction away from said second member, and a flange integrally extending from said second member over said arcuate surface around the peripheries of said first and second members sealingly capturing said bead.

8. In a method of manufacturing a transmission fluid filter which includes the steps of providing separate sheet metal and plastic filter members and crimping an integral peripheral flange on said sheet metal member over a peripheral lip on said plastic member around the peripheries of the respective said members, the improvement for reducing residual stresses in said plastic member wherein said step of providing said plastic filter member includes the step of forming a continuous bead around said lip, and wherein said step of crimping said flange over said lip comprises the step of deforming said flange onto said bead around said peripheries sealingly to capture said bead.

4,450,082

METHOD FOR OBTAINING UNIFORM STREAM IN ADSORPTION COLUMN

Masatoshi Tanouchi, Arcadia, Calif., and Yoshiyuki Asahina, Nobeoka, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Jun. 1, 1982, Ser. No. 383,693

Claims priority, application Japan, Jun. 11, 1981, 56-88812; Jun. 11, 1981, 56-88813; Oct. 29, 1981, 56-172096; Nov. 2, 1981, 56-174434

Int. Cl.³ B01D *15/00*

U.S. Cl. 210—660 11 Claims

1. A method for obtaining a uniform stream in an adsorption column for adsorbing and separating a substance to be separated from a mixture, the adsorption column having at least one single-flow passage in which the ratio of the inner diameter of the column to the average particle size of a packing to be packed in the adsorption column is at least 20, the method comprising classifying the packing to be packed into the adsorption column so that the classification latitude of each fraction is within 10% of the average particle size of the packing before the classification, and packing the fractions of the packing into the adsorption column in the order of particle size.

4,450,083

AGENT FOR DISSOLVING INSOLUBLE IRON(III) COMPOUNDS IN HIGHLY ALKALINE TEXTILE TREATMENT LIQUORS

Werner Streit, Bobenheim; Klaus Lorenz, Worms, and Norbert Leppert, Speyer, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Mar. 4, 1983, Ser. No. 472,207

Claims priority, application Fed. Rep. of Germany, Mar. 19, 1982, 3210004

Int. Cl.³ D06L *3/10*; B08B *3/00*

U.S. Cl. 252—8.6 3 Claims

1. An aqueous formulation, based on reducing agents and complexing agents, for dissolving insoluble iron(III) compounds in aqueous textile treatment baths which are at a pH of 10 or more, which formulation has the following composition:

(a) from 4 to 65% by weight of one or more water-soluble hydroxycarbonyl compound or of an N- or O-acetal thereof, as the reducing agent,

(b) from 10 to 80% by weight of one or more complexing agent which complexes Fe^{++} ions at a pH of 10 or more and

(c) water in an amount equal to 100% minus the amounts of (a) and (b).

4,450,084

OIL RECOVERY PROCESS EMPLOYING A NON-IONIC GLUCAN IN COMBINATION WITH CLAY FLOCCULANT

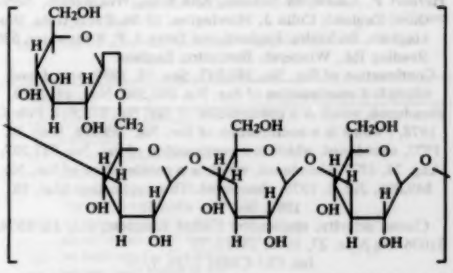
Milton K. Abdo, Dallas, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 229,372, Jan. 29, 1981, Pat. No. 4,347,146. This application Jun. 8, 1982, Ser. No. 386,461

Int. Cl.³ E21B *43/22*

U.S. Cl. 252—8.55 D 2 Claims

1. In an improved process for producing petroleum from a petroleum-bearing subterranean formation wherein an aqueous driving fluid containing a poly(glycosylglucan) thickening agent, the glycosylglucan having the structural formula:



is injected into said formation through an input well and passed through the formation to an output well, the improvement comprising employing in combination with said poly(glycosylglucan) between about 5 ppm and about 50 ppm of a sacrifical clay flocculant which is a long chain polyethylene oxide, having a molecular weight of about 100,000 to 7,000,000 and the structure (—O—CH_2—CH_2—)n wherein n is about 200 to

100,000, whereby adsorption of said poly(glycosylglucan) by clays is minimized.

4,450,085

DETERGENT SOFTENER COMPOSITIONS

Harold E. Wixon, New Brunswick, N.J., assignor to Colgate Palmolive Company, New York, N.Y.

Division of Ser. No. 259,728, May 1, 1981, Pat. No. 4,326,971, which is a continuation-in-part of Ser. No. 201,168, Oct. 27, 1980, Pat. No. 4,329,237, which is a continuation-in-part of Ser. No. 96,370, Nov. 21, 1979, Pat. No. 4,298,480, which is a continuation-in-part of Ser. No. 968,532, Dec. 11, 1978, Pat. No. 4,230,590. This application Apr. 22, 1982, Ser. No. 370,850

Int. Cl.[3] **C11D** *9/10, 10/04, 13/18;* **D06M** *13/48*

U.S. Cl. 252—8.75 **10 Claims**

1. A process for preparing soap-containing particles which dissolve rapidly in cold water, comprising:

(a) mixing 40–90 weight percent of a fatty acid soap, 2–40 weight percent of a nonionic organic surfactant, and 1–15 weight percent magnesium sulfate, to form a substantially homogeneous, plastic mass; and

(b) shaping the mixture into particles.

4,450,086

PRODUCTION OF CADMIUM SULFIDE COMPOSITIONS HAVING UNUSUAL MAGNETIC AND ELECTRICAL PROPERTIES

Clarke G. Homan, Schenectady; David P. Kendall, Brunswick, and Robert K. MacCrone, Colonie, all of N.Y., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jul. 16, 1981, Ser. No. 283,714

Int. Cl.[3] **C04B** *35/00;* **C01G** *11/02*

U.S. Cl. 252—62.51 **4 Claims**

1. A process for producing a cadmium sulfide composition which has a black color, contains lenticular platelets, has a structural morphology containing retained high pressure NaCl phase, and exhibits increased electrical conduction and large diamagnetism and large paramagnetism, which comprises pressure quenching a cadmium sulfide composition containing between about 0.5% and 3.0% by weight chlorine obtained by precipitation from an aqueous cadmium chloride solution with hydrogen sulfide to produce a precipitate consisting essentially of a mixture of cadmium sulfide and a complex compound of cadmium sulfide and cadmium chloride together with adhering uncomplexed cadmium chloride, and washing the precipitate with water to remove uncomplexed cadmium chloride.

4,450,087

VAPOR LOCK RESISTANT HYDRAULIC FLUIDS

Herbert F. Askew, 68 Foxcote, Kiln Ride, Wokingham, Berkshire, England; Colin J. Harrington, 19 St. Pauls Gate, Wokingham, Berkshire, England, and Terry J. P. Bridgwater, 520 Reading Rd., Winnersh, Berkshire, England

Continuation of Ser. No. 188,517, Sep. 18, 1980, abandoned, which is a continuation of Ser. No. 095,350, Nov. 19, 1979, abandoned, which is a continuation of Ser. No. 875,611, Feb. 6, 1978, , which is a continuation of Ser. No. 799,096, May 20, 1977, abandoned, which is a continuation of Ser. No. 717,207, Aug. 24, 1977, abandoned, which is a continuation of Ser. No. 549,096, Jul. 8, 1975, abandoned. This application Mar. 18, 1983, Ser. No. 476,561

Claims priority, application United Kingdom, Jul. 12, 1974, 31036/74; Mar. 27, 1975, 13113/75

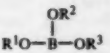
Int. Cl.[3] **C10M** *1/26, 1/54*

U.S. Cl. 252—73 **7 Claims**

1. A composition of matter suitable for use as a hydraulic fluid which comprises

(a) at least 20%, by weight, of a lubricating oil which is a member selected from the group consisting of a mineral oil, a synthetic hydrocarbon oil, a synthetic carboxylic acid ester, a siloxane or a phosphate ester;

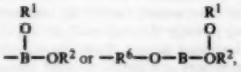
(b) 1 to 50%, by weight, of oil-soluble borate ester which is a compound, or mixture of compounds, having the formula:



wherein:

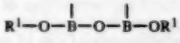
(i) R^1, R^2 and R^3 are the same or different and each is an aryl group or a straight or branched chain alkyl group or alicyclic group containing from 4 to 20 carbon atoms, or is a group of the formula $—R^4O)_nR^5$ wherein each R^4 is the same or different and each is an alkylene group selected from ethylene, propylene or butylene, R^5 is an alkyl group containing from 1 to 18 carbon atoms, or an aryl group, and n is an integer, from 1 to 10; or

(ii) R^1 and R^2 are the same or different and as defined above and R^3 is a group of the general formula:



wherein R^1 and R^2 are as defined above and R^6 is an alkylene group containing from 4 to 20 carbon atoms, or is an oxyalkylene radical of the formula $—R^4—OR^4)_n$ wherein R^4 and n are as defined above; or

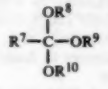
(iii) R^1 is as defined above and R^2 and R^3 together form the group



wherein R_1 is as defined above;

(c) 0.5 to 20%, by weight, of an amine which prevents deposition of oil insoluble hydrolysis products of the borate ester; and

(d) 1 to 50%, by weight, of an oil soluble orthoester of the formula:



wherein R^7 is hydrogen or lower alkyl; R^8, R^9 and R^{10} are the same or different and each is a straight or branched chain alkyl containing from 4 to 20 carbon atoms, benzyl or the group $—(R^{11}—O)_m—R^{12}$ where R^{11} is a lower alkylene group and R^{12} is an alkyl group containing 1 to 20 carbon atoms; and m is an integer from 2 to 10.

4,450,088

CORROSION INHIBITED ALCOHOL COMPOSITIONS

Joe C. Wilson, Woodhaven, and Stanley T. Hirozawa, Birmingham, both of Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

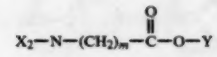
Filed May 19, 1983, Ser. No. 496,009

Int. Cl.[3] **C09K** *15/00, 15/20, 15/30;* **C23F** *11/14*

U.S. Cl. 252—75 **8 Claims**

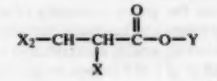
1. An antifreeze concentrate composition excluding alkali metal nitrites consisting essentially of in admixture, an alcohol selected from the group consisting of at least one of methanol, ethanol, propanol, ethylene glycol, diethylene glycol, triethylene glycol, propylene glycol and glycerol and, as an inhibitor, an effective amount of

(A) an amino acid or derivative having the formula:



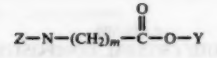
(I)

wherein m is an integer of 1–6, Y is selected from a group consisting of H, an alkali metal, and NH_4 and X is selected from a group consisting of CH_2CH_2OH, C_1–C_6 alkyl, phenyl, and H; or



(II)

wherein Y is selected from a group consisting of H, an alkali metal, and NH_4 and X is selected from a group consisting of phenyl, H, and NH_2; wherein at least one X is NH_2; or



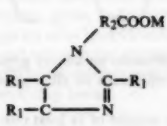
(III)

wherein m is an integer of 1–6, Y is selected from a group consisting of H, an alkali metal, and NH_4 and Z is C_2–C_5 alkylene,

(B) a conventional corrosion inhibitor selected from the group consisting of at least one of the alkali metal carbonates, borax, the alkali metal dichromates, the alkali metal dichromates, the alkali metal silicates, the alkali metal nitrates, phosphorous acid, phosphoric acid, an alkali metal tungstate, an alkali metal salt of benzoic or toluic acid, an alkali metal salt of a phenol, benzotriazole, tolyltriazole, and an organo-silicone compound;

(C) about 0.5 percent to about 15 percent by weight of an alkali metal phosphate; and

(D) about 0.03 percent to about 2 percent by weight of a heterocyclic nitrogen compound having the formula:



wherein R_1 is individually selected from hydrogen or a monovalent radical selected from the group consisting of straight or branched chain monovalent alkyl radicals having 1 to 18 carbon atoms, a monovalent cycloalkyl or alkoxy radical having up to 18 carbon atoms, a monovalent alkylene radical having 1 to 18 carbon atoms, a monovalent aryl radical, a monovalent alkylaryl radical having 1 to 18 carbon atoms in the alkyl portion thereof, or wherein each R_1 is combined into a single divalent alkyl radical having 2 to 18 carbon atoms; wherein R_2 is a divalent radical selected from the group consisting of alkyl and alkoxy radicals having 2 to about 18 carbon atoms, and where alkoxy, said radical is derived from an alkylene oxide selected from the group consisting of ethylene oxide, propylene oxide, butylene oxide, tetrahydrofuran, and mixtures thereof; and wherein M is an alkali metal.

4,450,089

STABILIZED BLEACHING AND LAUNDERING COMPOSITION

Guy Broze, Grace-Hollogne, and Leopold Laitem, Orp-le-Grand, both of Belgium, assignors to Colgate-Palmolive Company, New York, N.Y.

Filed Oct. 21, 1982, Ser. No. 435,829

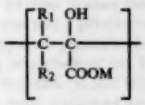
Int. Cl.³ C11D *7/18, 7/56, 3/37*

U.S. Cl. 252—95 **15 Claims**

1. A particulate bleaching detergent composition comprising

(a) from about 2 to 50%, by weight, of a bleaching agent consisting essentially of an alkali metal perborate in combination with an activator therefor;

(b) from about 0.1 to about 5%, by weight, of a polymer containing monomeric units of the formula



wherein R_1 and R_2 independently represent hydrogen or an alkyl group containing from 1 to 3 carbon atoms, and M represents hydrogen, or an alkali metal, an alkaline earth metal or ammonium cation;

(c) from about 3 to 50%, by weight, of at least one detergent surface active agent selected from the group consisting of anionic, cationic, nonionic, ampholytic and zwitterionic detergents;

(d) from about 0 to 10%, by weight, of a non-polymeric sequestering agent;

(e) from about 1 to 60%, by weight, of a detergent builder salt other than that defined in (b) and (d); and

(f) the balance comprising water and optionally filler salts.

4,450,090

THICKENED ALPHA-OLEFIN SULFONATE CONTAINING FORMULATIONS

James Kinney, Ramsey, N.J., assignor to Clairol Incorporated, New York, N.Y.

Filed May 16, 1983, Ser. No. 494,756

Int. Cl.³ C11D *1/14, 3/48*

U.S. Cl. 252—106 **14 Claims**

11. A liquid soap composition comprising

Ingredient	Amount (Weight %)
(a) Alpha-olefin sulfonate surfactant	2–40
(b) C_{12}–C_{22} unsaturated fatty acid diester of a glucoside polyethoxylated with from 110 to 150 moles of (OCH_2CH_2)	1–20
(c) At least one C_8–C_{18} fatty acid alkanolamide foam boosting aid	0–10
(d) At least one C_8–C_{18} alkyl betaine foam boosting aid	0–10
(e) Propylene glycol solubilizing agent	1–5
(f) Preservative	0.05–0.5
(g) Perfume	0–1
(h) Color	0–0.1
(i) Water	q.s. to 100%.

4,450,091

HIGH FOAMING LIQUID SHAMPOO COMPOSITION

Irving R. Schmolka, Grosse Ile, Mich., assignor to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Mar. 31, 1983, Ser. No. 480,756
Int. Cl.³ A61K 7/06; C11D 17/00, 1/83
U.S. Cl. 252—174.21 11 Claims

1. A liquid shampoo having a viscosity greater than about 6400 centipoise comprising by weight about 2 to 25 percent nonionic surfactant, about 1 to 5 percent anionic surfactant, about 4 to 20 percent amphoteric surfactant, about 1 to 5 percent alkanolamide, about 1 to 5 percent polyoxyalkylene glycol di fatty acid ester and about 40 to 85 percent by weight water, said nonionic surfactant being a cogeneric mixture of conjugated polyoxybutylene-polyoxyethylene compounds containing in their structure oxybutylene groups, oxyethylene groups and an organic radical derived from a water-soluble organic compound containing a plurality of reactive hydrogen atoms and 2 to 12 carbon atoms; the compounds being characterized in that all of the oxybutylene groups are present in polyoxybutylene chains that are attached to the organic radical at the site of a reactive hydrogen atom thereby constituting a polyoxybutylene polymer; the oxyethylene groups being attached to the polyoxybutylene polymer in polyoxyethylene chains; the average molecular weight of the polyoxybutylene polymers in the mixture being at least 500, as determined by hydroxyl number, and the oxyethylene groups present constituting 65 to 80 percent, by weight, of the mixture.

4,450,092

REDUCING TURBIDITY IN TURBID WATERS

Shu-Jen W. Huang, Schaumburg, Ill., assignor to Nalco Chemical Company, Oak Brook, Ill.

Filed Jun. 11, 1982, Ser. No. 387,546
Int. Cl.³ C02F 5/12
U.S. Cl. 252—181 15 Claims

1. A composition for reducing turbidity in turbid waters consisting essentially of an aqueous solution of:

(a) a substance selected from the group consisting of aluminum chloride, aluminum sulfate, ferric chloride and ferric sulfate, and

(b) a water soluble organic positively charged polymeric coagulant having an average molecular weight of at least 2000 which is a polydiallyl dimethylammonium chloride polymer,

the weight ratio of (a) to (b) being within the range of 0.75:1 to 4:1.

4,450,093

INDOLIZINONE DYES AND COMPOSITIONS, ELEMENTS AND METHODS USING SAME

George L. Fletcher, Pittsford, and Donald H. Wadsworth, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

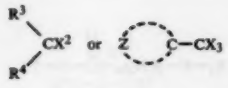
Division of Ser. No. 278,023, Jun. 29, 1981, Pat. No. 4,373,021. This application Nov. 22, 1982, Ser. No. 443,788
Int. Cl.³ C09K 3/00; G03C 5/24
U.S. Cl. 252—182 6 Claims

1. A composition reactable with pyridine to form a dye, said composition comprising

a cyclopropenone having the structural formula

1

and either a compound having the structural formula



2a 2b

wherein

R^1 and R^2 are individually alkyl of 1 to 5 carbon atoms, aryl of 6 to 10 nuclear carbon atoms, or a heterocyclic group of from 5 to 6 nuclear atoms selected from the group consisting of carbon, oxygen, and sulfur;

R^3 is selected from the group consisting of aryl of 6 to 10 nuclear carbon atoms and bearing a bathochromic substituent; nitro; carbonyl; amide; sulfonyl; and cyano;

R^4 is hydrogen, alkyl of 1 to 5 carbon atoms, halogen, or one of the group of R^3;

X is halogen;

and Z represents the non-metallic atoms necessary to complete one, two or three fused rings of 5 to 14 nuclear atoms selected from the group consisting of carbon and nitrogen.

4,450,094

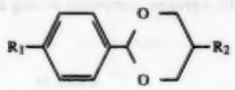
NEMATIC LIQUID CRYSTAL COMPOSITIONS FOR DISPLAY APPARATUSES

Hideo Sato; Yasuyuki Goto; Hideo Saito; Shinichi Sawada, all of Yokohamashi; Keiichi Matsunami, Kawasakishi, and Kohzo Hirata, Yokohamashi, all of Japan, assignors to Chisso Corporation, Osaka, Japan

Filed Dec. 24, 1980, Ser. No. 219,921
Claims priority, application Japan, Dec. 28, 1979, 54-172753; Jan. 18, 1980, 55-4235
Int. Cl.³ C09K 3/34; C02F 1/13
U.S. Cl. 252—299.61 2 Claims

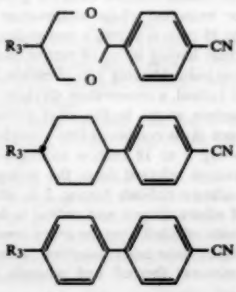
1. In a multiplexed drive liquid crystal display, the improvement wherein the liquid-crystalline composition comprises

(a) 15 to 75% by weight of at least one compound having the formula



wherein R_1 represents an alkoxy group of 1 to 10 carbon atoms and R_2 represents an alkyl group of 1 to 10 carbon atoms, and

(b) 25 to 76% by weight of at least one compound selected from the group consisting of



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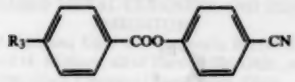
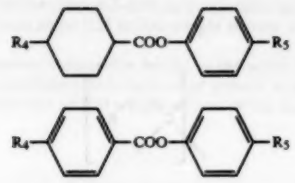


wherein R_3 represents an alkyl group having 1 to 7 carbon atoms.

2. The display containing the liquid-crystalline composition according to claim 1 wherein the composition contains up to 30% by weight of at least one compound selected from the group expressed by the formulas:



wherein R_4 and R_5 each represent an alkyl group or an alkoxy group of 1 to 7 carbon atoms.

4,450,095

ORGANOPHILIC CLAY GELLANT HAVING ENHANCED DISPERSIBILITY

Claude M. Finlayson, Houston, Tex., assignor to NL Industries, Inc., New York, N.Y.

Filed Nov. 17, 1980, Ser. No. 207,544

Int. Cl.³ B01J *13/00*

U.S. Cl. 252—315.2 **6 Claims**

1. An organophilic clay gellant having enhanced dispersibility in organic systems and capable of increasing the viscosity of a liquid organic system without the addition of a polar organic dispersant, comprising the reaction product of a methyl or benzyl trialkyl ammonium compound, wherein the alkyl group contains 14 to 20 carbon atoms, and a bentonite clay having a cation exchange capacity of at least 75 milliequivalents per 100 grams of said clay, and wherein the amount of said ammonium compound is from 100 to 120 milliequivalents per 100 grams of said clay, 100% active clay basis.

4,450,096

METAL HYDROCARBYL PHOSPHORODITHIOATES AND LUBRICANTS CONTAINING SAME

Andrew G. Horodysky, Cherry Hill, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Feb. 22, 1982, Ser. No. 350,691

Int. Cl.³ C10M *1/48*

U.S. Cl. 252—32.7 E **17 Claims**

1. A reaction product formed by reacting a 1,2-C_{15} through C_{18} alkane vicinal diol mixture with a phosphorus polysulfide, followed by reacting the product thus obtained with a metal containing compound.

4,450,097

ANTIOXIDATIVE COMPOUND, METHOD OF EXTRACTING SAME FROM ROSEMARY, AND USE OF SAME

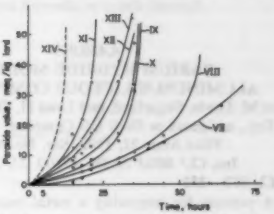
Nobuji Nakatani, Tokyo; Reiko Inatani, Osaka, and Tadashi Konishi, Kanagawa, all of Japan, assignors to Lion Corporation, Tokyo, Japan

Filed Feb. 23, 1982, Ser. No. 351,631

Claims priority, application Japan, Feb. 26, 1981, 56-27434; Mar. 29, 1981, 56-45783

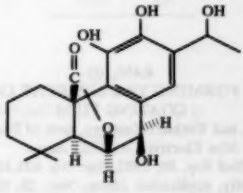
Int. Cl.³ C09K *15/08, 15/34;* A23L *1/28*

U.S. Cl. 252—404 **8 Claims**



6. A method for preventing oxidation of an organic material which comprises admixing the organic material with 7β,11,12-trihydroxy-6,10-(epoxymethano)abieta-8,11,13-trien-20-one.

7. 7β,11,12-Trihydroxy-6,10-(epoxymethano)abieta-8,11,13-trien-20-one expressed by the following structural formula:



8. A method for the preparation of 7β,11,12-trihyroxy-6,10-(epoxymethano)abieta-8,11,13-trien-20-one which comprises the steps of

(a) extracting rosemary with a non-polar organic solvent to give an extracted material in the solvent,

(b) extracting the extracted material obtained in the step (a) above with an aqueous alkaline solution having a pH of at least 1.5 to give a weakly acidic fraction,

(c) subjecting the weakly acidic fraction to column chromatography.

4,450,098

PROCESS FOR PREPARING A POLYMERIZATION CATALYST AND PREPARATION OF ETHYLENE POLYMERS WITH THIS CATALYST

Lambertus J. M. A. van de Leemput, Echt, and Godefridus A. H. Nooijen, Helden-Panningen, both of Netherlands, assignors to Stamicarbon B.V., Geleen, Netherlands

Filed Aug. 5, 1982, Ser. No. 405,372

Claims priority, application Netherlands, Aug. 6, 1981, 8103700

Int. Cl.³ C08F *4/62*

U.S. Cl. 502—107 **7 Claims**

1. A process for preparing a chromium-containing catalyst component which, upon activation with heat at a temperature of from 200° to 1200° C. will effect the polymerization of alpha-olefins, which process comprises:

a. applying to an inert inorganic support the reaction product of

(1) a chromium compound, with

(2) one or more group II or III metal hydrocarbyl compounds, wherein the hydrocarbyl groups contain 1–20 carbon atoms; and

b. thereafter treating the product of step (a) with an atmosphere containing molecular oxygen at a temperature less than 100° C., or an organic compound containing one or more hydroxygroups reactive with the hydrocarbyl groups of said product to decompose the reactive hydrocarbyl-groups thereon.

4,450,099

BARIUM HYDRIDE MODIFIED ALUMINUM/SILICEOUS COMPOSITIONS

Robert M. Lewis, Sugarland, and Lynn H. Slaugh, Cypress, both of Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Mar. 21, 1983, Ser. No. 477,182

Int. Cl.³ B01J *21/08, 29/00, 21/10, 23/08*

U.S. Cl. 502—232 **8 Claims**

1. A process for preparing a metal oxide gel composition having bonded thereto barium oxide, which process comprises contacting a substantially anhydrous metal oxide gel with a powdered barium hydride in a slurry phase with the slurrying medium being an anhydrous, non-hydroxyl-containing organic liquid whereby the barium hydride reacts with the metal oxide gel, and subsequently drying the gel to remove the organic liquid.

4,450,100

PASTE FOR FORMING TRANSPARENT CONDUCTIVE COATING FILM

Mitsuru Kano, and Yoshimi Kamijyo, both of Furukawa, Japan, assignors to Alps Electric Co., Ltd., Japan

Filed Sep. 30, 1982, Ser. No. 431,322

Claims priority, application Japan, Nov. 25, 1981, 56-188887

Int. Cl.³ H01B *1/06*

U.S. Cl. 252—518 **1 Claim**

1. A paste for forming a transparent conductive coating film comprising $In(acac)_3$, $(CH_3)_2SN(acac)_2$, about 13 to 17 weight percent of deacidified nitrocellulose, and a solvent consisting essentially of the following components in the weight percents indicated:

Butyl carbitol . . . 40 to 44
Butyl cellosolve . . . 20 to 30
Butyl acetate . . . 20 to 22
Dimethyl phthalate . . . 10 to 22.

4,450,101

ORGANOLEPTIC COMPOSITIONS WITH SUBSTITUTED TRICYCLODECANE COMPOUNDS

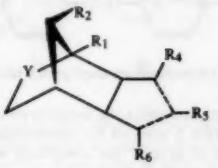
Mark A. Sprecker, Sea Bright, and John B. Hall, Rumson, both of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 220,628, Dec. 29, 1980, abandoned, which is a division of Ser. No. 144,898, Apr. 29, 1980, Pat. No. 4,275,251. This application Aug. 20, 1981, Ser. No. 294,732

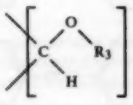
Int. Cl.³ A61K *7/46*

U.S. Cl. 252—522 R **1 Claim**

1. A patchouli perfume composition comprising a patchouli perfume base and intimately admixed therewith a mixture of chemical compounds comprising a major proportion of at least one compound defined according to the structure:

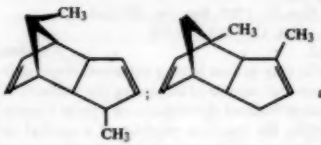


wherein Y is the moiety having the structure:

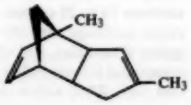


wherein both of the dashed lines represent carbon-carbon single bonds; wherein R_1 and R_2 represent hydrogen or methyl with the proviso that one of R_1 and R_2 is hydrogen and the other of R_1 and R_2 is methyl; wherein R_4, R_5 and R_6 represent hydrogen or methyl with the proviso that one of R_4, R_5 and R_6 is methyl and the other two of R_4, R_5 and R_6 is hydrogen and wherein R_3 is hydrogen produced by the process comprising the steps of:

(a) reacting in the presence of a protonic acid catalyst or a Lewis acid catalyst a dimethyl cyclopentadiene isomer having a structure selected from the group consisting of:



and



with at least one C_1–C_2 alkanoic acid or at least one C_1–C_2 alkanoic acid anhydride at a temperature in the range of from about 0° C. up to about 50° C. in the presence of an acid catalyst with the concentration of acid catalyst in the reaction mass varying from about 0.01% up to 1 mole percent based on the weight of reaction mass;

(b) hydrolyzing the resultant ester using a hydrolysis agent which is from 10 up to 50% by weight of the reaction mass of an alkali metal hydroxide at a hydrolysis temperature of from about 40° C. up to reflux; and

(c) reacting the resulting product with hydrogen using a hydrogenation catalyst selected from the group consisting of Raney nickel, supported palladium on carbon or calcium carbonate and supported platinum on carbon or calcium carbonate at a temperature of reaction of from about 10° C. up to about 50° C. and a reaction pressure of from about 25 psig up to 300 psig in the presence of an inert solvent.

4,450,102

SULFUR BASED METAL CLEANERS AND CORROSION INHIBITORS

Merlin R. Lindstrom; Gary D. Macdonell; Rector P. Louthan, and Donald H. Kubicek, all of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Nov. 2, 1982, Ser. No. 438,553
Int. Cl.³ C07C 145/00, 149/26; C07D 207/12; C23G 1/18
U.S. Cl. 252—542 3 Claims

1. An aqueous composition having as the active ingredient 2-(N-2-pyrrolidino)ethyl-2-hydroxyethyl sulfide present in an amount of from about 0.25 to 20.0 weight percent of the composition.

2. An aqueous composition having as the active ingredient 2-(N-2-pyrrolidonyl)ethyl-2-carboxylethyl sulfide present in an amount of from about 0.25 to 20.0 weight percent of the composition.

3. An aqueous composition having as the active ingredient bis(2-[N-2-pyrrolidonyl]ethyl) disulfide present in an amount of from about 0.25 to 20.0 weight percent of the composition.

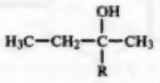
4,450,103

PROCESS FOR RECOVERING HUMAN IFN-β FROM A TRANSFORMED MICROORGANISM

Michael W. Konrad, Alameda, and Leo S. Lin, Fremont, both of Calif., assignors to Cetus Corporation, Emeryville, Calif.

Filed Mar. 1, 1982, Ser. No. 353,360
Int. Cl.³ C07G 7/00; C12P 21/00, 21/02; A61K 45/02
U.S. Cl. 260—112 R 29 Claims

1. A process for extracting unglycosylated human IFN-β solubilized with an appropriate solubilizing agent from an aqueous medium comprising contacting the aqueous medium containing the unglycosylated human IFN-β with an organic extractant of the formula



where R is hydrogen or methyl under conditions wherein an aqueous and an organic phase are formed.

4,450,104

WATER INSOLUBLE GEL MATRIX CONTAINING LECTIN BOUND TO ANTITHROMBIN

Robert E. Jordan, Concord, Calif., assignor to Cutter Laboratories, Inc., Berkeley, Calif.

Division of Ser. No. 192,286, Sep. 30, 1980, Pat. No. 4,386,025.
This application Sep. 29, 1982, Ser. No. 426,560
Int. Cl.³ C07G 7/00; A61K 31/725
U.S. Cl. 260—112 B 5 Claims

1. A composition for fractionating heparin into components of differing activity by virtue of differing affinity for antithrombin, which comprises a lectin-containing, water-insoluble gel matrix having reversibly bound thereto antithrombin specific for gradiently binding the components of differing activity in heparin.

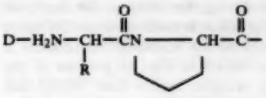
4,450,105

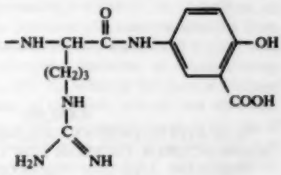
SUBSTRATES FOR MEASURING THROMBIN

Takeshi Nagasawa; Katsumasa Kuroiwa, and Katsuyuki Takabayashi, all of Koriyama, Japan, assignors to Nitto Boseki Co., Ltd., Fukushima, Japan

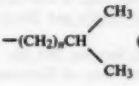
Filed Aug. 6, 1982, Ser. No. 406,025
Claims priority, application Japan, Sep. 28, 1981, 56-153472
Int. Cl.³ C07C 103/52; C12Q 1/38
U.S. Cl. 260—112.5 R 1 Claim

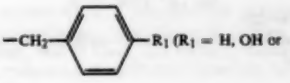
1. A novel substrate for measuring thrombin which has chromophoric and fluorescent properties on thrombin or thrombin-like enzymes and is represented by a compound of the following general formula or a salt thereof:



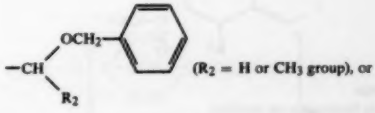


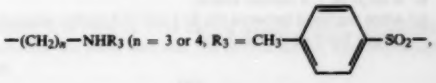
wherein

R represents  (n = 0,1 or 2),

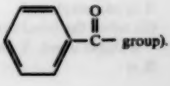
 (R_1 (R_1 = H, OH or

group),

 (R_2 = H or CH_3 group), or



or

 group).

4,450,106

LIGNIN PRODUCT FOR LOWERING THE VISCOSITY OF CEMENT AND OTHER FINELY-DIVIDED MINERAL MATERIAL SUSPENSIONS

Bengt Forss, Pargas, Finland, assignor to Flowcon Oy, Toijala, Finland

Continuation of Ser. No. 374,755, May 4, 1982, abandoned, which is a continuation of Ser. No. 204,002, Nov. 4, 1980, abandoned. This application Jul. 8, 1983, Ser. No. 511,994

Claims priority, application Finland, Nov. 5, 1979, 793453

Int. Cl.³ C07G *1/00*; D21C *3/20*

U.S. Cl. 260—124 R **3 Claims**

1. In a method for producing a lignin product suitable for dispersing cement or other finely divided mineral materials which comprises adding amines, quinone or anthraquinone derivatives as catalysts to a pulping cook to prevent the splitting and dissolution of carbohydrates and to stabilize the cellulose and the hemicellulose during the cooking, the improvement wherein said lignin product is isolated from the spent liquor by ultrafiltration and/or ion exchange to produce a lignin sulfonate product in which at least 40 percent of the molecules have molecular weights higher than 10,000 and which product has a degree of sulfonation lower than 0.4.

4,450,107

7α-ALKOXYCARBONYL-15β,16β-METHYLENE-4-ANDROSTENES, PROCESS FOR THE PREPARATION THEREOF, AND USE THEREOF AS MEDICINAL AGENTS

Klaus Nickisch; Henry Laurent; Rudolf Wiechert, and Jorge Casals-Stenzel, all of Berlin, Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

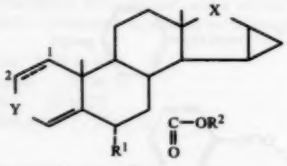
Filed Mar. 23, 1982, Ser. No. 361,164

Claims priority, application Fed. Rep. of Germany, Mar. 23, 1981, 3111951

Int. Cl.³ A61K *31/58*

U.S. Cl. 424—238 **15 Claims**

1. A 7α-alkoxycarbonyl-15β,16β-methylene-4-androstene of the formula

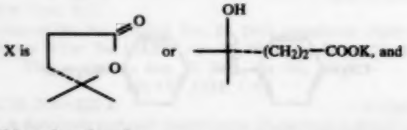


wherein

R^1 is hydrogen or methyl,

R^2 is alkyl or 1–4 carbon atoms,

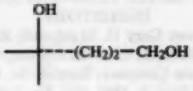
(a) when the bond between the C-1 and C-2 carbon atoms is a single bond or double bond



Y is carbonyl, and

(b) when the bond between the C-1 and C-2 carbon atoms is a single bond, X and Y can also be

X is



and

Y is

12. A method of achieving a diuretic effect in a patient in need of such treatment comprising administering to the patient a diuretically effective amount of a compound of claim 1.

4,450,108

PYRROLOBENZOTRIAZEPINES

Rudolf Fischer, Kehrsatz; Franz M. Künzle, Berne, and Jean Schmutz, Muri, all of Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

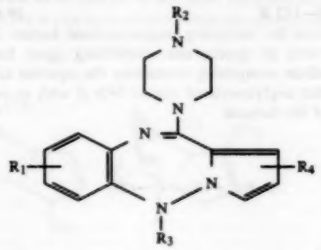
Filed Dec. 17, 1980, Ser. No. 217,528

Claims priority, application Switzerland, Dec. 21, 1979, 11415/79

Int. Cl.³ C07D *403/14*

U.S. Cl. 260—243.3 **12 Claims**

1. A compound of formula I,



I

wherein

R_1 and R_4 are each independently hydrogen, halogen, (C_{1-4})alkyl, (C_{1-4})alkoxy, (C_{1-4})alkylthio or trifluoromethyl,

R_2 is hydrogen, (C_{1-4})alkyl, (C_{2-4})-hydroxyalkyl or alkanoyl (C_{1-4})-oxyalkyl, and

R_3 is hydrogen, (C_{1-4})alkyl, (C_{3-5})alkenyl or benzyl,

said compound being in free base or in pharmaceutically acceptable acid addition salt form.

4,450,109

THIAZINOBENZIMIDAZOLE DERIVATIVES

Hiromichi Eto, Abiko; Teruo Kohmoto, Chiba; Tadayuki Kouda, Narita; Youichiro Ogawa, Chiba; Susumu Sato, Chiba; Tadayuki Kuraishi, Chiba, and Toshiaki Nakashima, Higashi-shisui, all of Japan, assignors to SS Pharmaceutical Co., Ltd., Tokyo, Japan

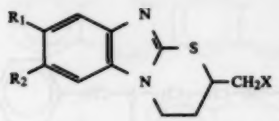
Division of Ser. No. 240,219, Mar. 3, 1982, Pat. No. 4,369,309. This application Sep. 13, 1982, Ser. No. 417,596

Claims priority, application Japan, Jun. 20, 1980, 55-83710

Int. Cl.³ C07D *513/04*

U.S. Cl. 260—243.3 **1 Claim**

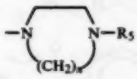
1. A thiazinobenzimidazole derivative represented by formula (I):



(I)

wherein R_1 and R_2 are each a hydrogen atom, an alkyl group having 1 to 6 carbon atoms, an alkoxy group having 1 to 6 carbon atoms or halogen atom, and X represents a hydroxy group, a tosyloxy group, an azide group, an alkylcarbonyloxy group having 1 to 6 carbon atoms, a trimethoxyphenylcarbonyloxy group, a thioether group, an alkyloxy group having 1 to 6 carbon atoms, an alkenyloxy group, a phenyloxy group, a benzyloxy group, a morpholino group,

wherein R_3 is a hydrogen atom or alkyl group having 1 to 6 carbon atoms, and R_4 is a hydrogen atom, an alkyl group having 1 to 6 carbon atoms, alkyl group having 1 to 2 carbon atoms and substituted by hydroxyl, alkyloxycarbonyl, cyclohexyl, furanyl or indolyl; phenyl which may be substituted by alkyl, alkoxy or halogen atom; benzyl, phenylamino,



wherein R_5 represents a hydrogen atom, an alkyl group having 1 to 6 carbon atoms, hydroxyethyl, pyrrolidinocarbonylmethyl, pyrrolidinopropyl, trimethoxy phenylcarbonyloxypropyl or trimethoxyphenylcarbonyl, and n represents an integer of 2 or 3;

wherein m represents an integer of 4, 6 or 7; or piperidino which may be substituted by alkyl having 1 to 6 carbon atoms, hydroxy, alkyloxycarbonyl or benzyl.

4,450,110

AZIDO NITRAMINE

Ronald L. Simmons, Destin, and Herbert L. Young, Shalimar, both of Fla., assignors to Hercules Incorporated, Wilmington, Del.

Filed Mar. 24, 1983, Ser. No. 478,437
Int. Cl.³ C07C *117/00*
U.S. Cl. 260—349 **1 Claim**

1. The azidonitramine composition 1,5-diazido-3-nitraza pentane.

4,450,111

PROCESS FOR THE PURIFICATION OF ANTHRAQUINONE

Tatsuyoshi Komatsu, Kamakura; Shigeaki Numata, Yokohama, and Kazuhiro Maruyama, Kawasaki, all of Japan, assignors to Kawasaki Kasei Chemicals Ltd., Tokyo, Japan

Filed Apr. 29, 1982, Ser. No. 373,106
Claims priority, application Japan, Jun. 9, 1981, 56-87499
Int. Cl.³ C07C *49/68*
U.S. Cl. 260—369 **8 Claims**

1. In a process for purifying crude anthraquinone obtained by the oxidation of the adduct obtained from the Diels-Alder reaction of butadiene with 1,4-naphthoquinone, said naphthoquinone being obtained by the catalytic vapor phase oxidation of naphthalene with molecular oxygen in an aqueous alkali metal hydroxide solution, the improvement comprising:

subjecting said crude anthraquinone to oxidation in an aqueous medium containing hypochlorite ion as the sole oxidizing agent.

4,450,112

PROCESS FOR CONVERTING NITRILES TO CARBOXYLIC ESTERS

Stanley S. Wreford, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Nov. 25, 1981, Ser. No. 325,028
Int. Cl.³ C11C *3/02*
U.S. Cl. 260—410.9 R **15 Claims**

1. A process for making carboxylic acid esters and recyclable ammonia comprising reacting a nitrile of 2 to 18 carbons, an alcohol and water in the presence of a catalyst selected from the group consisting of one or more complexes of a metal with hydroxo and tertiary phosphine moieties, at a temperature between about 100° C. to 250° C., wherein the metal is selected from the group consisting of rhodium, iridium and platinum, and wherein the nitrile is selected from the group consisting of alkanenitriles of at least two carbons, alkanedinitriles of at least 3 carbons, alkenenitriles of at least 4 carbons, and alkenedinitriles of at least 6 carbons.

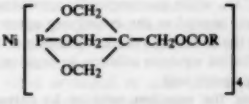
4,450,113

ZEROVALENT NICKEL PHOSPHITE COMPLEXES

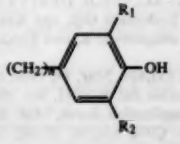
Ingenuin Hechenbleikner, West Cornwall; William P. Enlow, Falls Village, both of Conn., and David C. Lankin, Schaumburg, Ill., assignors to Borg-Warner Chemicals, Inc., Parkersburg, W. Va.

Filed Aug. 9, 1982, Ser. No. 406,732
Int. Cl.³ C07F *15/04*
U.S. Cl. 260—439 R **6 Claims**

1. A zerovalent nickel complex having the structural formula



where R is alkyl of 1–18 carbon atoms, phenyl, alkylphenyl wherein the alkyl contains 1–6 carbon atoms, hydroxyphenyl or



where R_1 and R_2 are lower alkyl, and n is 0–2.

4,450,114
PROCESS FOR PRODUCTION OF SULFURIC ACID SEMIESTERS

Taira Fujita, Nishinomiya; Hiroyuki Nakagawa, Kawanishi; Mikio Sugihara, Takatsuki; Kimiyuki Kobayashi, Minoo, and Katuhiko Okamoto, Kyoto, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Division of Ser. No. 116,623, Jan. 29, 1980, Pat. No. 4,351,765.
This application May 20, 1982, Ser. No. 380,334
Claims priority, application Japan, Feb. 13, 1979, 54-15791
The portion of the term of this patent subsequent to Sep. 28, 1999, has been disclaimed.
Int. Cl.³ C07C *141/16*
U.S. Cl. 260—458 C **3 Claims**

1. In a process for producing an esterified compound having one β-sulfatoethylsulfone group of the formula $-SO_2CH_2CH_2OSO_3M$, wherein M is hydrogen or an alkali metal, which comprises reacting a starting compound having one β-hydroxyethylsulfone group of the formula, $\beta-SO_2CH_2CH_2OH$, with an esterifying agent, the improvement comprising:

(1) conducting the reaction in the presence of a water-insoluble organic solvent and a secondary amine selected from the group consisting of diheptylamine, dioctylamine, didecylamine, didodecylamine, ditetradecylamine, dihexadecylamine, dioctadecylamine, dibenzylamine, di-α-methylbenzylamine, di-2-ethylhexylamine, bis-(2-methylcyclohexylmethyl)amine, N-methyldodecylamine, N-(2-ethylhexyl)-2-pentylnonylamine, N-benzyldodecylamine, N-benzyltetradecylamine, N-α-methylbenzyl-2-ethylhexylamine, N-3-phenylpropyl-n-tetradecylamine, N-methyltetradecylamine and N-methyloctadecylamine, or a tertiary amine selected from the group consisting of trihexylamine, trioctylamine, tridecylamine, tridodecylamine, N-methyldioctylamine, N-methyldidecylamine, N-methyldidodecylamine, N-methyldioctadecylamine, N-methyldiethylhexylamine, N-dodecyldimethylamine, N-dodecyldiethylamine, N-dodecyldibutylamine, N-dodecyldihexylamine, N-dodecyldibenzylamine (dibenzyldodecylamine), N-benzyldidodecylamine, N-propyldidecylamine, N-butyldidodecylamine, N-tetradecyldibenzylamine, N-isooctyldibenzylamine, di(methylbenzyl)dodecylamine, dibenzyloctadecylamine, dibenzyloctylamine and dibenzyldecylamine; the starting compound being an aromatic intermediate for the production of dyes selected from the group consisting of azo dyes, anthraquinone dyes, naphthalene dyes, pyrazolone dyes, and phthalocyanine dyes; the esterifying agent being one member selected from the group consisting of sulfamic acid and sulfuric acid, and being used in an amount of from 1 to 10 moles per β-hydroxyethylsulfone group of the starting compound, the amount of the amine being from 1 to 10 moles per mole of the starting compound, and the reaction being carried out at a temperature of from about 60° to about 180° C., while azeotropically removing water when sulfuric acid is used as the esterifying agent;

(2) washing the resulting reaction mixture with water or a weakly alkaline aqueous solution to remove excess of the esterifying agent; and

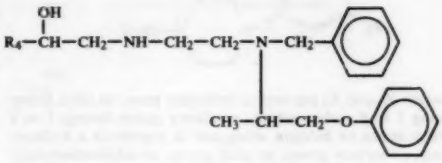
(3) subjecting the reaction mixture to extraction with a weakly alkaline aqueous solution, whereby an aqueous solution containing the desired product is obtained.

4,450,115
AMINO-ALCOHOL DERIVATIVES

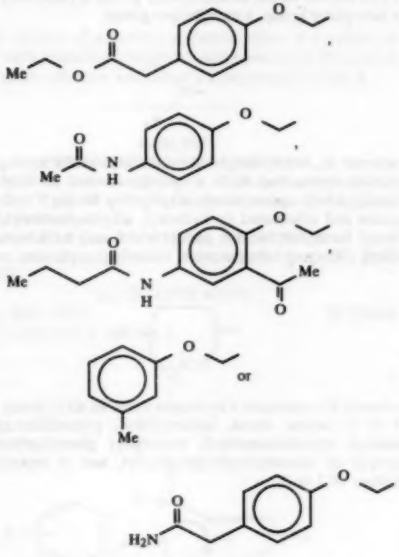
Hiroshi Takizawa; Yoshimasa Oiji, and Kazuhiro Kubo, all of Shizuoka, Japan, assignors to Kyowa Hakko Kogyo Co., Ltd., Tokyo, Japan

Division of Ser. No. 131,490, Mar. 18, 1980, Pat. No. 4,381,398.
This application Jul. 9, 1981, Ser. No. 281,874
Claims priority, application Japan, Mar. 20, 1979, 54-31750
Int. Cl.³ C07C *121/80, 95/08, 103/29*
U.S. Cl. 260—465 E **23 Claims**

1. A compound of the formula

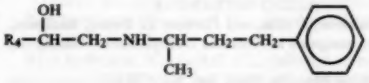


wherein R_4 represents

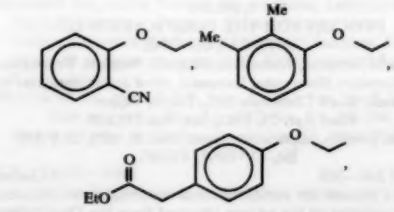


wherein Me represents a methyl group.

2. A compound of the formula



wherein R_4 represents H_2N



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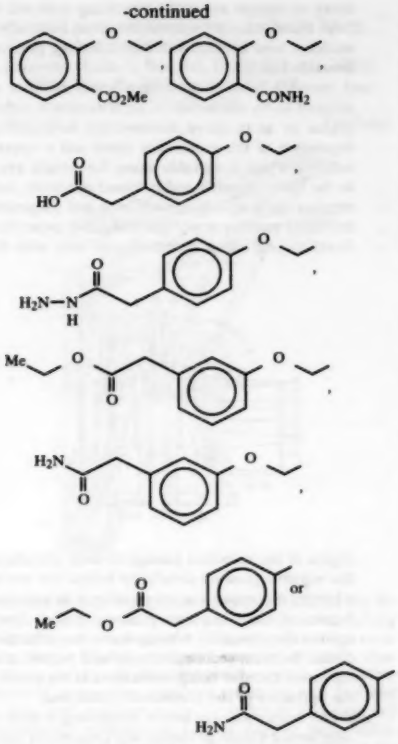


wherein Me represents a methyl group and Et represents an ethyl group.

4,450,116

3-OXYPROPYLENEIMINO-BIS-(METHYLENE PHOSPHONIC ACIDS) AND THEIR SALTS, PROCESS FOR THEIR MANUFACTURE AND THEIR USE

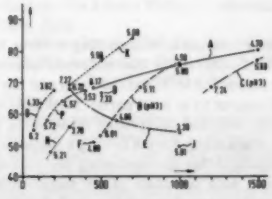
Hans-Joachim Morawietz, Kelkheim; Erich Hoffman; Johann Hanauer, both of Kriftel, and Kurt Bauer, Kelsterbach, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Jul. 14, 1982, Ser. No. 398,097

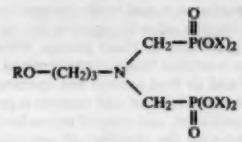
Claims priority, application Fed. Rep. of Germany, Jul. 21, 1981, 3128755

Int. Cl.³ C07F 9/36; C22B 1/00

U.S. Cl. 260—502.5 E **2 Claims**



1. A compound of the formula



wherein R is straight-chain or branched alkyl having from 2 to 20 carbon atoms, and X is hydrogen, an alkali metal, alkaline earth metal, ammonium, alkylammonium or polyalkylene polyammonium ion.

4,450,117

VARIABLE VENTURI-TYPE CARBURETOR

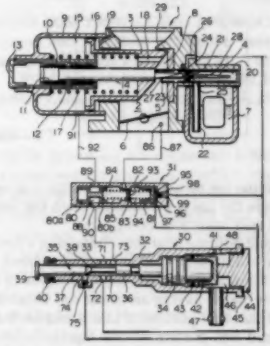
Norihiko Nakamura; Takaaki Ito; Takashi Katou, all of Mishima; Yozo Ota, Chiryu, and Toshiharu Morino, Mie, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota and Aisan Industry Co., Ltd., Obu, both of, Japan

Filed Sep. 14, 1982, Ser. No. 417,907

Claims priority, application Japan, Dec. 21, 1981, 56-205201

Int. Cl.³ F02M 9/06

U.S. Cl. 261—39 A **15 Claims**



1. A variable venturi-type carburetor comprising:

an intake passage formed in said carburetor and having an inner wall;

a casing having therein an interior chamber which extends perpendicular to said intake passage;

a suction piston movably inserted into said casing and having a tip face which projects into said intake passage and defines a venturi portion, said suction piston dividing the interior chamber of said casing into an atmospheric pressure chamber and a vacuum chamber which is connected to said venturi portion for moving said suction piston in response to a change in the amount of air flowing within said intake passage;

a throttle valve arranged in said intake passage located downstream of said suction piston;

a fuel passage having a metering jet therein and being open to said intake passage for feeding fuel into said intake passage;

a needle fixed onto the tip face of said suction piston and extending through said fuel passage and said metering jet;

an air bleed passage having an air inlet and an air outlet which is open to said fuel passage, said air inlet being open to the atmosphere;

an air feed passage having an air inlet and an air outlet which is open to said vacuum chamber, said air inlet being open to the atmosphere; and

control means arranged in said air bleed passage and said air feed passage and controlling the flow areas of said air

bleed passage and said air feed passage in response to a change in vacuum produced in said intake passage located downstream of said throttle valve for opening said air feed passage and shutting off said air bleed passage when the level of said vacuum is smaller than a predetermined level and for shutting off said air feed passage and opening said air bleed passage when the level of said vacuum is greater than the predetermined level, said control means having a delay device for delaying the shutting-off operation of said air feed passage and/or the opening operation of said air bleed passage for a period of time after the level of said vacuum becomes greater than the predetermined level.

4,450,118

APPARATUS FOR SATURATING A GAS WITH THE VAPOR OF A LIQUID

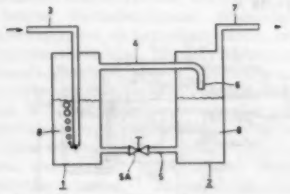
Hermanus N. Tuin, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 19, 1982, Ser. No. 369,790

Claims priority, application Netherlands, Apr. 29, 1981, 8102105

Int. Cl.³ B01F *3/04*

U.S. Cl. 261—147 **2 Claims**



1. An apparatus for saturating a gas with a liquid vapor of the type wherein the gas is bubbled through the liquid characterized in that said apparatus comprises:

(a) a first liquid holding chamber containing a first portion of said liquid maintained at a temperature above the saturation temperature of said gas for said vapor of said liquid,

(b) a gas inlet means having an outlet end located below the surface of said first portion of said liquid for bubbling said gas into said first portion of said liquid,

(c) a second liquid holding chamber containing a second portion of said liquid maintained at the saturation temperature of said gas for said vapor of said liquid,

(d) a gas conduit means connecting said first liquid holding chamber to said second liquid holding chamber the inlet of said gas conduit means being located in said first said liquid holding chamber above the surface of said first portion of said liquid and the outlet of said gas conduit means being located in said second liquid holding chamber above the surface of said second portion of said liquid.

4,450,119

VARIABLE VENTURI CARBURETOR

Keiun Kodo, 1-9, 4-chome, Sakuragaoka, Minoo, Osaka 562, Japan

Filed Sep. 30, 1982, Ser. No. 428,799

Claims priority, application Japan, Jan. 27, 1982, 57-12405

Int. Cl.³ F02M *9/12*

U.S. Cl. 261—44 D **2 Claims**

1. A variable venturi carburetor for an internal combustion engine comprising,

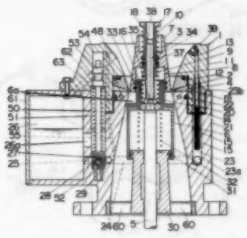
a tubular housing having an induction passage extending downwardly therethrough;

a throat extending into said passage from the inner wall of the housing and having an annular orifice opened to the interior of the housing;

a float chamber interconnected to said orifice through fuel supply passage means for feeding fuel to the orifice;

a movable head being axially movable within the housing along an upright axis and cooperating with said throat to form therebetween an annular venturi zone whose cross sectional area is increased with lowering position of the movable head;

said movable head comprising a lower member which is adapted to be connected to an accelerator pedal for the engine so as to move downwardly in response to the depression of the accelerator pedal and a upper venturi member which is movable along the upright axis relative to the lower member and is biased upwardly, said upper member defining said venturi zone and cooperating with the lower member to provide a negative pressure chamber therebetween which communicates only with the lower



region of the induction passage so as to introduce therein the negative pressure developed behind the venturi zone, whereby the upper venturi member is in response to the degree of such negative pressure pulled downwardly against the upwardly biasing force in a direction to increase the cross sectional area of said venturi zone while the lower member being maintained at the position set by the operation of the accelerator pedal; and

said fuel supply passage means comprising a main fuel passage having a main jet therein and an auxiliary fuel passage having therein a power jet which is operative to open only when the negative pressure developed behind the venturi zone is above a predetermined level.

4,450,120

CONCRETE FORM AND METHOD OF ASSEMBLING AND DISMANTLING THE SAME

Josef Maier, Schwimmbadstr. 3, D-7611 Steinach, Fed. Rep. of Germany

Filed Sep. 15, 1981, Ser. No. 302,378

Claims priority, application Fed. Rep. of Germany, Sep. 26, 1980, 3036306

Int. Cl.³ E04G *11/10*

U.S. Cl. 264—31 **41 Claims**

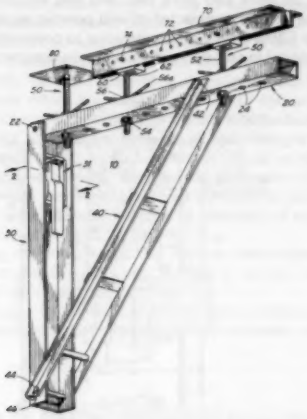
1. For use in a method of dismantling a form for casting ceiling or roofs of concrete or like materials wherein at least two panels are assembled to define the form and the panels are dismantled subsequent to at least partial hardening of the cast material, the improvement comprising dismantling the panels by mounting a dismantling device having a supporting portion on one of the panels so that the supporting unit extends beneath and defines a gap with the other of the panels; lowering the other panel onto the supporting portion; and pivoting the other panel on the supporting portion to thereby separate the panels.

4,450,121

APPARATUS AND METHOD FOR BRIDGE DECK CONSTRUCTION

Noah L. Bequette, Route 1, Box 663, Cedar Hill, Mo. 63016

Filed Mar. 5, 1982, Ser. No. 354,158
Int. Cl.³ E04B 1/16
U.S. Cl. 264—31 19 Claims



1. A method of supporting decking or forms needed for the installation of roadways on bridges which comprises attaching a plurality of apparatus, each of which comprises a first elongated member, a second elongated member pivotally connected at one end to said first elongated member, third elongated member connecting separated points on said first and second elongated members so as to maintain said first and second elongated members in a fixed angular relationship, which third elongated member is pivotally connected to the first elongated member and detachably connected to the second elongated member; positioning means attached to said first elongated member, which positioning means supports a fourth elongated member, which fourth member is adapted to support the forms or decking and attaching means on said second elongated member for removably installing the apparatus on a substantially vertical surface of a support structure, which attaching means comprises toggle locking means particularly suited to engage a concave recess in a steel pin protruding from a substantially vertical surface of the support structure to a plurality of steel pins, each of which has a concave recess particularly designed to engage the toggle locking means of one of the apparatus, which pins are protruding from a substantially vertical surface of the support structure; and individually adjusting the fourth elongated member of each of said apparatus to support the forms or decking in the desired position.

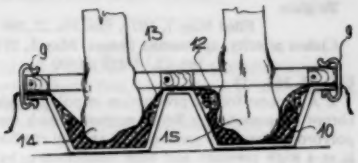
4,450,122

METHOD AND APPARATUS FOR MANUFACTURING FOOT SUPPORTS WITH ANATOMICALLY CONTOURED SHANK PORTIONS

Rolando Gallina, Via Monte Pelmo, 3, Montebelluna (Province of Treviso), Italy

Filed Oct. 2, 1980, Ser. No. 193,196
Claims priority, application Italy, Oct. 9, 1979, 41620 A/79
Int. Cl.³ B29D 27/04
U.S. Cl. 264—46.4 5 Claims

1. A method of manufacturing foot supports such as insoles and the like with an anatomically configurated surface corresponding to the bottom of user's foot, comprising the steps of: arranging on a supporting surface at least one pad of spongy material, impregnating said pad with a foamable hardenable reactive chemical composition, positioning the user's foot onto the impregnated pad and causing the impression of the user's foot to be formed onto said impregnated pad, leaving the user's foot in position onto said pad until the reactive chemical composition has attained a sufficient



degree of hardness to maintain the impression unaltered, removing the foot thereafter from the pad and cutting and trimming the impressed and hardened pad to obtain a foot support therefrom with desired contour.

4,450,123

PROCESS FOR PRODUCING MICROCAPSULES

Setsuya Egawa, and Masahiro Sakamoto, both of Kanagawa, Japan, assignors to Jujo Paper Co., Ltd., Tokyo, Japan

Filed Jun. 25, 1982, Ser. No. 392,142
Claims priority, application Japan, Jul. 17, 1981, 56-110918
Int. Cl.³ B01J 13/02
U.S. Cl. 264—4.7 15 Claims

1. Process for producing microcapsules which use an amino resin as a capsule-wall in a system in which hydrophobic core material is dispersed in an aqueous acidic solution containing an anionic colloidal substance, wherein said anionic colloidal substance comprises an anionic, water-soluble copolymer consisting of at least three monomers including acrylic acid, hydroxyalkylacrylate or hydroxyalkylmethacrylate and styrenesulfonic acid and said anionic, water-soluble copolymer is used in amount of 2 to 10 parts by weight per 100 parts by weight of said hydrophobic core material.

4,450,124

PRODUCTION OF COMPACTED, LARGE-CALIBER EXPLOSIVE CHARGES

Wolfgang Christmann, Bergisch-Gladbach; Gerhard Lindner, Rosrath, and Paul Lingens, Odenthal, all of Fed. Rep. of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Fed. Rep. of Germany

Filed Nov. 30, 1979, Ser. No. 98,947
Claims priority, application Fed. Rep. of Germany, Dec. 4, 1978, 2852334
Int. Cl.³ C06B 21/00
U.S. Cl. 264—3 R 3 Claims

1. A process for the production of compacted large-caliber explosive charges with a primary charge and a prefabricated booster charge, which comprises pressing the explosive of the booster charge into a dimensionally rigid housing so that the booster charge explosive withstands the maximum compacting pressure during subsequent combined compacting with the primary charge, forming the primary charge into at least one rough-compacted body and then further compacting the at least one rough-compacted body of the primary charge together with the explosive of the booster charge in the dimensionally rigid housing within a preformed casing.

4,450,125
PROCESS FOR THE PRODUCTION OF POLYPROPYLENE FIBRIDS

Georges Voituron, Vilvoorde, and Jean-Pierre Pleska, Paturages, both of Belgium, assignors to Solvay & Cie, Brussels, Belgium

Filed May 7, 1979, Ser. No. 37,399
Claims priority, application France, May 5, 1978, 78 13600
Int. Cl.³ D21F *11/00*
U.S. Cl. 264—13 **17 Claims**

1. A process for the production of polypropylene fibrids by abrupt expansion of a liquid mixture which contains molten polypropylene and a predominant amount of alkane and which is at a high pressure and high temperature, by ejecting the liquid mixture through an expansion orifice to instantaneously vaporize the alkane and to solidify the polypropylene, which comprises:

forming a liquid mixture comprised of said molten polypropylene, said alkane solvent for the polypropylene and a minor amount of a liquid which is a non-solvent for the polypropylene, said non-solvent liquid being dissolved in the liquid mixture, and wherein the amount of said non-solvent liquid which is present in said liquid mixture in the form of a distinct phase having a predominant content of non-solvent liquid is a zero amount; and

abruptly expanding said liquid mixture containing said non-solvent liquid by ejection through said expansion orifice to instantaneously vaporize said alkane and to solidify said polypropylene.

4,450,126
HIGH STRENGTH NYLON BLEND MEMBRANES

Robert E. Kesting, Irvine, Calif., assignor to Puropore, Inc., Tustin, Calif.

Filed Apr. 21, 1982, Ser. No. 370,340
Int. Cl.³ B29D *27/00*; B29H *7/20*; C08V *9/28*
U.S. Cl. 264—41 **1 Claim**

1. In the process of manufacturing dry phase inversion microporous membranes which comprises forming a casting solution comprising solvent and polymer, casting the solution, and evaporating solvent, the improvement comprising the steps of:

(a) forming the casting solution consisting essentially of formic acid and two nylon polymers, an high molecular weight extrusion grade nylon homopolymer and a multipolymer nylon, the total nylon content of the solution being in the general range of from about ten to about thirty-grams per one hundred milliliters of solution, the ratio of high molecular weight homopolymer nylon to multipolymer nylon being in the general range of from about 1:1 to 9:1, optimally in the ratio of about 4:1;

(b) casting a film or fiber of said solution; and

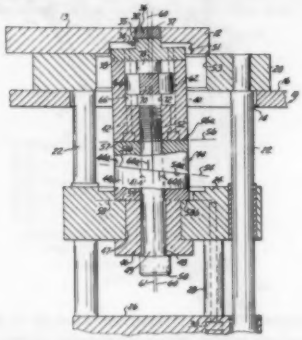
(c) evaporating the formic acid.

4,450,127
METHOD FOR COMPACTING POWDER MATERIAL WITH ADJUSTABLE DIE AND PUNCH ASSEMBLY

Raymond P. DeSantis, Troy, and Herbert J. Puffer, Jr., Garden City, both of Mich., assignors to PTX Pentronix, Inc., Lincoln Park, Mich.

Continuation-in-part of Ser. No. 351,482, Feb. 23, 1982, Pat. No. 4,390,335. This application Sep. 20, 1982, Ser. No. 419,827
Int. Cl.³ C04B *33/32*
U.S. Cl. 264—56 **2 Claims**

1. In a method for compacting powder material in a die cavity in a die plate having an upper surface, a bore through said die plate, a punch having an end slidably disposed in said bore in said die plate, said punch having an end face normally substantially parallel to said die plate upper surface, a punch base member, a reciprocal platen supporting said punch base member, and means for reciprocating said platen, said die cavity being defined in said bore between said punch end face and said die plate upper surface, said method comprising filling said die cavity with powder material by means of a dispenser unit in the form of an open bottom enclosure having a bottom edge in sliding engagement with said upper surface, displacing said powder dispenser unit for wiping said powder material in said die cavity to a surface level relatively flush with said die plate upper surface, subsequently placing an anvil face over said die cavity and compacting said powder material in said die cavity between said anvil face and said punch end face for forming articles compacted of said powder material, wherein uneven filling of said die cavity prior to compacting said powder material in said die cavity causes the compacted articles to

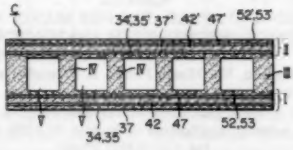


warp during sintering, said uneven filling being caused by said wiping action of the bottom edge of said powder material dispenser unit upon said powder material surface level, said improvement comprising adjustably inclining said punch for disposing said punch end face non-parallel to said die plate upper surface and substantially parallel to the surface level of powder material after wiping of said surface level by said bottom edge of said powder material dispenser unit, compacting a plurality of articles, sintering said articles, and readjusting the inclination of said punch and repeating said compacting, sintering and measuring steps until the least amount of warpage of said articles after sintering is achieved.

4,450,128
GLASS FIBER-REINFORCED CEMENT PLATES

Shigeru Takeuchi, Osaka, Japan, assignor to Kurimoto Iron Works, Ltd., Osaka, Japan

Division of Ser. No. 191,801, Sep. 29, 1980, Pat. No. 4,335,177. This application Dec. 10, 1981, Ser. No. 329,455
Claims priority, application Japan, Oct. 3, 1979, 54-129019; Jul. 16, 1980, 55-99041; Jul. 21, 1980, 55-99647
Int. Cl.³ B28B *1/08*
U.S. Cl. 264—70 **17 Claims**



12. A process for manufacturing a laminated, glass fiber-reinforced, hydraulic cement plate comprising:

dispensing chopped glass-fiber strands and continuous glass fibers onto an endless conveyor belt which is constantly moving at a fixed speed to form a bottom layer comprising at least one sublayer of said chopped glass-fiber strands and at least one sublayer of continuous glass fibers, said

bottom layer being substantially free of hydraulic cement mortar;

then dispensing onto said bottom layer, as said bottom layer continues moving on said conveyor belt, a fluid mortar containing regulated set hydraulic cement, while vibrating said bottom layer with vibrating means, so that said fluid mortar permeates into said bottom layer and also forms an intermediate layer on top of said bottom layer which is adhered to said bottom layer;

then dispensing onto said intermediate layer, as said bottom and intermediate layers continue moving on said conveyor belt, chopped glass-fiber strands and continuous glass fibers which are substantially free of hydraulic cement mortar to form a top layer on said intermediate layer comprising at least one sublayer of said chopped glass-fiber strands and at least one sublayer of said continuous glass fibers, so that said fluid mortar permeates into said top layer and thereby adheres said top layer to said intermediate layer, thereby forming an assembly of said bottom, intermediate and top layers;

then curing the assembly of said bottom, intermediate and top layers by moving same through a curing zone by means of said conveyor belt; and

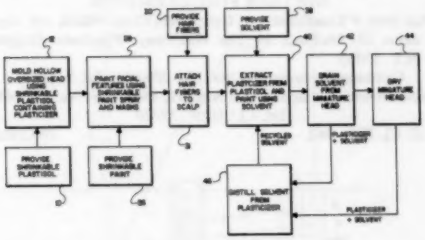
then moving said assembly out of said curing zone to obtain said laminated, glass fiber-reinforced hydraulic cement plate.

4,450,129

METHOD OF MAKING MINIATURE DOLL HEADS

Ralph Dunn, Playa Del Rey, and Leonard R. Coleman, Long Beach, both of Calif., assignors to Mattel, Inc., Hawthorne, Calif.

Filed Jan. 24, 1983, Ser. No. 460,347
Int. Cl.³ B29C *5/12*; B29D *9/00*
U.S. Cl. 264—132 **9 Claims**


PROVIDE HAIR FIBERS
PROVIDE SOLVENT
MOLD HOLLOW OVERSIZED HEAD USING SHRINKABLE PLASTISOL CONTAINING PLASTICIZER
PAINT FACIAL FEATURES USING SHRINKABLE PAINT SPRAY AND MASKS
ATTACH HAIR FIBERS TO SCALP
EXTRACT PLASTICIZER FROM PLASTISOL AND PAINT USING SOLVENT
DRAIN SOLVENT FROM MINIATURE HEAD
DRY MINIATURE HEAD
PROVIDE SHRINKABLE PLASTISOL
PROVIDE SHRINKABLE PAINT
RECYCLED SOLVENT
PLASTICIZER + SOLVENT
DISTILL SOLVENT FROM PLASTICIZER
PLASTICIZER + SOLVENT

1. A method of making a miniature doll head comprising the steps of:

providing a plastisol material including a plastic resin and an extractable plasticizer;

forming an oversized hollow doll head from the plastisol where the oversized doll head is larger than the desired size of the miniature doll head;

providing a solvent shrinkable paint capable of decreasing in size as the substrate to which it is applied decreases in size;

applying the paint to the face of the oversized doll head to form facial features which realistically simulate the facial features of the oversized doll head;

providing doll hair formed of plastic strands; and

attaching the doll hair to the scalp of the oversized doll head, where the hair is spaced apart on the scalp a greater distance than the desired spacing on the miniature doll head so that when the oversized doll head is reduced in size the spacing of the doll hair will be reduced to the desired spacing on the miniature doll head;

providing an extraction solvent capable of extracting the plasticizer from the plastisol and said paint;

immersing the oversized doll head in the solvent until sufficient plasticizer is extracted to achieve the desired size reduction;

draining excess solvent from the part; and

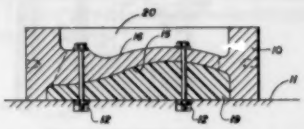
heating the part to accelerate drying and to cause excess solvent to migrate out of the doll head.

4,450,130

METHOD OF FIXTURING SHOE COMPONENT

Daniel M. Doerer, Chesterfield, Mo., assignor to Brown Group, Inc., St. Louis, Mo.

Filed May 3, 1982, Ser. No. 374,390
Int. Cl.³ B23C *5/00*
U.S. Cl. 264—154 **5 Claims**



1. A method for fixturing a shoe component while cutting the component from a starting block of rigid machinable material while supported on a work surface, said method comprising:

(a) cutting a first cavity in one side of the starting block to shape a first surface of the shoe component with the cutting of the first cavity being greater than the shape of the first surface to provide a marginal surface peripheral to the shape of the first surface;

(b) applying a mold release agent to only the first surface of the shoe component;

(c) filling the cavity in the starting block with a rigid material capable of adhering to the marginal surface peripheral to the shape of the first surface in the cavity but not to the surface of the shoe component to which the mold release agent is applied;

(d) cutting a second cavity in the side of the starting block opposite to said first cavity to partially shape a further surface of the shoe component with an exposed marginal surface surrounding the further surface;

(e) establishing a temporary attachment between the rigid machinable material and the shoe component for supporting that component;

(f) completing the shoe component by further cutting into the starting block in the second cavity to remove the starting block material between the first and the further surface of the shoe component such that a peripheral surface of the shoe component is cut to match the first surface and the further surface; and

(g) removing the temporary attachment to release the shoe component from the rigid machinable material and the filling material.

4,450,131

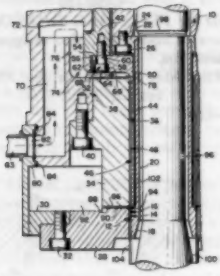
ZERO RUNOUT COUNTER-ROTATING FILM EXTRUDER

Thomas W. Martinek, Covington, Ind., assignor to Teepak, Inc., Chicago, Ill.

Filed Nov. 19, 1981, Ser. No. 322,838
Int. Cl.³ B29D *23/04*
U.S. Cl. 264—209.2 **15 Claims**

1. A tubular film extruder comprising first and second die members defining an elongated annular high shear passage, said die members having adjacent generated surfaces of rotation with one of said first and second die members presenting a first surface of said high shear passage, the other of said first and second die members presenting a second surface concentric with said first surface, one of said surfaces being disposed about an axis, means for mounting the other of said surfaces so

said other surface is hydrostatically radially shiftable and positionable about said axis, and means for rotating at least said one surface with extrudate flowing between said surfaces forming means for automatically centering said other surface relative to said one surface.



13. A process of extruding tubular films, said process comprising the steps of providing an elongated annular high shear passage defined by concentric generated surfaces of rotation at least one of which is rotating about an axis and the other of said surfaces is hydrostatically radially shifted about said axis to be concentric with said one surface with substantially zero runout to provide a uniform extrudate supply.

4,450,132

PLASTIC CRATE OR TRAY WITH SLIDE WALL INJECTION MOLDING POINTS

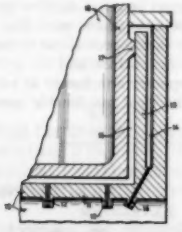
Ernst Ettema, Hardenberg; Coenraad J. B. M. Benraad, Dedemsvaart, and Klaas Roskam, Hardenberg, all of Netherlands, assignors to Wavin B.V., Zwolle, Netherlands

Continuation of Ser. No. 147,183, May 7, 1980, abandoned. This application May 19, 1982, Ser. No. 379,972

Claims priority, application Netherlands, May 11, 1979, 7903735

Int. Cl.³ B29F *1/04*

U.S. Cl. 264—328.8 **1 Claim**



1. The method of injection molding a plastic container having a bottom and vertical side walls having portions at least double walled having an upstanding partition (13) separating said side walls comprising injecting plastic in an injection mold having an open mold space for the whole container at a first injection molding point (12) at the bottom of the mold to form the container bottom and inside portion of the side walls while simultaneously injecting plastic at a second injection molding point in the mold at the bottom to form the outer container vertical wall without deflecting said upstanding partition (13).

4,450,133

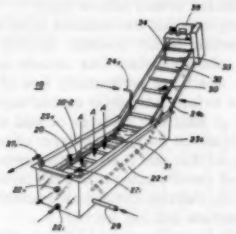
STABILIZATION OF MOLDED PARTS

Ralph J. Cafarelli, 228 Stone St., Clinton, Mass. 01510

Continuation-in-part of Ser. No. 097,495, Nov. 26, 1979, Pat. No. 4,246,917. This application Oct. 29, 1980, Ser. No. 201,778

Int. Cl.³ B29C *7/00*

U.S. Cl. 264—336 **8 Claims**



1. A method for stabilizing molded plastic parts comprising the steps of

(a) preparing a bath having a isothermal temperature distribution therein;

(b) expelling plastic parts from a mold into said bath to subject the exterior surfaces of the expelled parts to a differential temperature change that produces skin effect rigidity and;

wherein a chemical diluent is added to said bath to facilitate the wetting of said plastic parts and their entry into said bath.

4,450,134

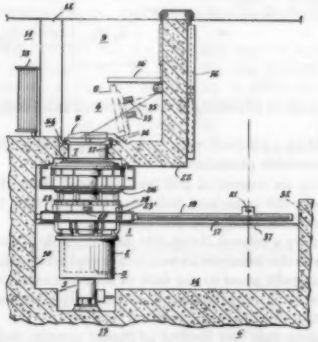
METHOD AND APPARATUS FOR HANDLING NUCLEAR FUEL ELEMENTS

Olaf Soot, 9 Tomahawk La., Greenwich, Conn. 06830, and Alexander H. McPhee, 89 The Waterway, Plandome Heights, N.Y. 11030

Continuation-in-part of Ser. No. 056,061, Jul. 9, 1981, abandoned. This application Aug. 12, 1981, Ser. No. 291,466

Int. Cl.³ G21C *19/20*

U.S. Cl. 376—262 **20 Claims**



10. An improved method for transferring nuclear fuel elements between a fuel storage pool of a nuclear facility and a nuclear fuel transfer cask comprising the steps of:

(a) positioning a wheeled transport means which travels on elevated tracks in a corridor between first and second terminal locations of a nuclear facility at a first terminal location, said transport means including a frame defining an aperture formed therein and a cask tank positioned vertically in and extending through said aperture and

supported on said transport, said cask tank extending below said transport means;

(b) lowering a nuclear fuel element cask into said tank at said first terminal location and establishing a fluid sealed barrier between inner and outer surfaces of said cask;

(c) advancing said transport means, said vertically supported tank and said cask in a horizontal direction to a said second location adjacent an overhead port of said nuclear fuel storage pool;

(d) unweighting said tank from said transport by vertically advancing said tank into engagement with said port and supporting said tank from beneath by a rigid structure;

(e) establishing a fluid sealed channel between said port and an interior of said cask;

(f) flooding the sealed channel;

(g) actuating a port closure to an open position for establishing clear access through said port between said pool and said cask; and

(h) transferring fuel elements between said cask and said pool.

4,450,135

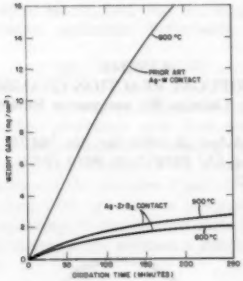
METHOD OF MAKING ELECTRICAL CONTACTS

Thomas E. Peters, Chelmsford; John C. Gustafson, Harvard, both of Mass., and Boon Wong, Reseda, Calif., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed Jan. 4, 1982, Ser. No. 336,648

Int. Cl.³ B22F *1/00, 3/00*

U.S. Cl. 419—12 **12 Claims**



1. A method for making electrical contacts consisting essentially of about 20 to about 50 weight percent conductive metallic constituent, from about 0.2 to about 1.0 weight percent metallic wetting agent with the balance consisting essentially of substantially completely oxide-free zirconium diboride comprising the steps of blending particulate zirconium diboride with from about 0.5 to about 2.0 weight percent of a particulate reducing agent consisting essentially of a mixture of carbon and boron, heating the mixture of zirconium diboride and reducing agent in an inert atmosphere at a temperature and for a period of time sufficient to produce zirconium diboride substantially completely free of oxides, blending the oxide-free zirconium diboride with from about 20 to about 50 weight percent of a particulate conductive metallic constituent and from about 0.2 to about 1.0 weight percent of a particulate metallic wetting agent, compacting the blended powder mixture, and liquid phase sintering the compacted powder in an oxygen free atmosphere to form a sintered body containing substantially completely oxide-free zirconium diboride.

4,450,136

CALCIUM/ALUMINUM ALLOYS AND PROCESS FOR THEIR PREPARATION

David M. Dudek, Salisbury, and Mark A. Lambert, Barkhamsted, both of, assignors to Pfizer, Inc., New York, N.Y.

Filed Mar. 9, 1982, Ser. No. 356,580

Int. Cl.³ C22C *1/00*

U.S. Cl. 420—590 **13 Claims**

1. A process for the preparation of a substantially homogeneous passive calcium/aluminum alloy having a calcium-/aluminum atomic ratio of from about 60/40 to 80/20, which comprises adding elemental aluminum to molten elemental calcium under an inert atmosphere to obtain a melt of a desired composition, the temperature of said melt during said addition being maintained at from about 550° to 1100° C., said aluminum being added at a rate to prevent substantial solids formation in said melt during said addition.

4,450,137

PROCESSES FOR INHIBITING CORROSION USING COMPOUNDS CONTAINING SULFUR AND AMINO GROUPS

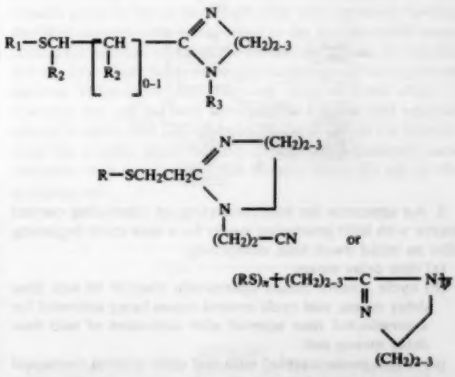
Neil E. S. Thompson, Creve Coeur; Derek Redmore, Webster Groves; Bernardus A. Oude Alink, St. Louis, and Benjamin T. Outlaw, Webster Groves, all of Mo., assignors to Petrolite Corporation, St. Louis, Mo.

Division of Ser. No. 320,048, Nov. 10, 1981, Pat. No. 4,393,026, which is a division of Ser. No. 161,198, Jun. 19, 1980, Pat. No. 4,332,967. This application Oct. 29, 1982, Ser. No. 437,778

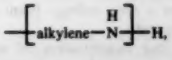
Int. Cl.³ C23F *11/04*

U.S. Cl. 422—12 **6 Claims**

1. A process for inhibiting corrosion which is characterized by treating a metal with a composition comprising a compound of the formula



where R, R_1 are hydrocarbon groups, R_2 is H or alkyl, R_3 is H, alkyl,



or alkanol, n and p are one or more; or mixtures thereof.

4,450,138

PROCESSES FOR INHIBITING CORROSION USING COMPOUNDS CONTAINING SULFUR AND AMINO GROUPS

Neil E. S. Thompson, Creve Coeur; Derek Redmore, Webster Groves; Bernardus A. Oude Alink, St. Louis, and Benjamin T. Outlaw, Webster Groves, all of Mo., assignors to Petrolite Corporation, St. Louis, Mo.

Division of Ser. No. 320,048, Nov. 10, 1981, Pat. No. 4,393,026, which is a division of Ser. No. 161,198, Jun. 19, 1980, Pat. No. 4,332,967. This application Oct. 29, 1982, Ser. No. 437,588

Int. Cl.³ C23F *11/04*

U.S. Cl. 422—12 **4 Claims**

1. A process for inhibiting corrosion which is characterized by treating a metal with a composition comprising a compound of the formula,

$$R_1-S-CH_2-\underset{\underset{OH}{|}}{CH}-CH_2-(N)$$

where R_1 is a hydrocarbon group, and (N) is an amino moiety.

4,450,139

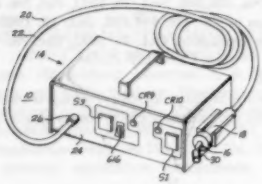
LIGHT GENERATING APPARATUS FOR CURING DENTAL RESTORATIVE COMPOSITES

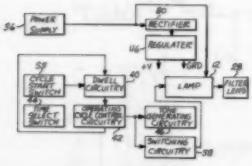
Ronald L. Bussiere, Edmonds, and Robert J. Smith, Lynnwood, both of Wash., assignors to Solid State Systems, Corporation, Lynnwood, Wash.

Filed May 3, 1982, Ser. No. 374,517

Int. Cl.³ B01J *1/10, 1/12*

U.S. Cl. 422—186.3 **22 Claims**





1. An apparatus for interconnecting an alternating current source with light generating means for a time cycle beginning after an initial dwell time, comprising:

(a) time delay means;

(b) cycle control means operatively coupled to said time delay means, said cycle control means being activated for a preselected time interval after activation of said time delay means; and

(c) switch means coupled with said cycle control means and interconnected between the alternating current source and the light generating means, said switch means:

in response to the activation of said cycle control means, interconnecting the alternating current source with the light generating means when the alternating current source crosses a zero voltage point in the alternating current cycle; and

in response to the deactivation of said cycle control means, disconnecting the alternating current source from the light generating means.

18. An apparatus for photochemically curing organic composites used to repair teeth, comprising:

(a) light generating means;

(b) means for applying the light produced by said light generating means on the organic composites;

(c) time delay means for producing an output signal at a preselected time period after activation of said time delay means;

(d) cycle control means operably coupled to said time delay means to produce a control signal for a preselected time interval in response to said output signal; and

(e) switch means coupled with said cycle control means and interconnected between an alternating current source and said light generating means, said switch means:

in response to said control signal, interconnecting the alternating current source with said light generating means at the point in the alternating current cycle when the alternating current crosses a zero voltage level; and

upon termination of said control signal, disconnecting the alternating current source from said light generating means.

4,450,140

Patent Not Issued For This Number

4,450,141

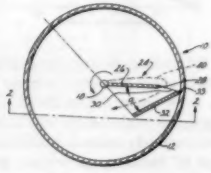
CENTRIFUGAL REACTION CHAMBER

Ronald K. Linde, Chicago, Ill., assignor to Envirosonics, Inc., Chicago, Ill.

Filed Jun. 16, 1982, Ser. No. 388,751

Int. Cl.³ B01F *7/20*; B01J *19/10*

U.S. Cl. 422—225 **2 Claims**



1. A centrifugal reaction chamber comprising:

a substantially cylindrical vessel for holding the chemical reactants, one of which is a liquid, a shaft journaled for rotation in the vessel and coaxial with the cylindrical vessel, one or more rotating mixing elements in the vessel secured to the shaft, and means for rotating the shaft and mixing elements, each mixing element including a pair of panels and means securing the panels in a fixed closely

spaced relationship to form a radially extending passage between the panels, a first panel of each mixing element extending radially outwardly from the shaft and terminating in an outer edge adjacent to but spaced from the cylindrical wall of the vessel, a second panel of each mixing element having an outer edge positioned at the cylindrical wall and extending inwardly from the cylindrical wall for a distance to overlap a substantial portion of the radial extent of said first panel and, thereby, provide a passage therebetween, the panels lying in planes which converge at an acute angle and intersect adjacent the point on the wall of the vessel nearest said outer edge of the first panel, said means for rotating the shaft moving the said first panel ahead of the second panel and forcing the reactants radially outwardly into engagement with the second panel at the wall of the vessel, the second panel forcing the reactants radially inwardly toward the center of the vessel along the backside of said first panel through said passage between the panels.

4,450,142

PROCESS FOR RECOVERING A URANIUM-CONTAINING CONCENTRATE AND PURIFIED PHOSPHORIC ACID

Cornelis A.M. Weterings, Stein, and Johannes A. Janssen, Schinveld, both of Netherlands, assignors to Stamicarbon B.V., Geleen, Netherlands

Filed Jul. 22, 1981, Ser. No. 285,322

Claims priority, application Netherlands, Jul. 23, 1980, 8004221

Int. Cl.³ C01G *43/00*

U.S. Cl. 423—8 **6 Claims**

1. A process for recovering a uranium-containing concentrate and purified phosphoric acid from wet-process phosphoric acid in the presence of a reducing agent effective to reduce uranium VI to uranium IV by treatment with first a lower alkyl ketone in the presence of said reducing agent, and thereafter adding, with agitation, an inorganic fluoride compound and separating off the uranium-containing precipitate, wherein said treatment and addition is conducted at ambient temperatures.

4,450,143

PROCESS FOR REDUCING THE ORGANIC SOLVENT LOSSES IN THE TREATMENT OF A SUSPENSION RESULTING FROM THE ACID ATTACK ON AN ORE

Antoine Floreancig, Saint-Genis-Laval; Bernard Siffert, Hoschstatt, and Jean-Jacques Trescol, Nogent-sur-Oise, all of France, assignors to Pechiney, France

PCT No. PCT/FR80/00174, 371 Date Jul. 1, 1981, 102(e) Date Jul. 1, 1981, PCT Pub. No. WO81/01577, PCT Pub. Date Jun. 11, 1981

PCT Filed Dec. 2, 1980, Ser. No. 279,529

Claims priority, application France, Dec. 5, 1979, 79 30275

Int. Cl.³ C22B *60/02, 34/22, 34/34;* B01D *11/00*

U.S. Cl. 423—10 **8 Claims**

1. A process for treating a hydrometallurgical suspension resulting from the acid attack on an ore containing at least one metal element which is to be put to use, and non-attackable mineral materials, a fraction of which is formed by clays, comprising extracting the useful metal element which has gone into solution in the attack operation, by means of an organic solvent belonging to the group formed by alkylphosphate acids, characterised in that, in order to limit the losses due to adsorption of the organic extraction solvent by the clays, a condensed mineral phosphate is introduced into the ore attack medium.

2. A treatment process according to claim 1 characterised in that the condensed phosphate selected from the group consisting of metaphosphates, polyphosphates, combinations of metaphosphates which contain both cyclic anion and long chain anions, or transverse-bound phosphates.

4,450,144

AMMONIUM HYDROXIDE STRIPPING OF TUNGSTEN FROM ORGANIC SOLVENTS

John M. Laferty, Wheat Ridge; Paul B. Queneau, Golden, and Leo W. Beckstead, Arvada, all of Colo., assignors to Amax Inc., Greenwich, Conn.

Continuation of Ser. No. 225,903, Jan. 19, 1981, abandoned. This application Jul. 21, 1982, Ser. No. 400,539

Int. Cl.³ C01G *41/00*

U.S. Cl. 423—54 **6 Claims**

1. A process for stripping tungsten values from a tungsten-bearing acidic liquid organic phase with a basic aqueous ammoniacal phase which comprises: establishing in a stripping unit an intimate mixture of the organic and aqueous phase, the aqueous phase being the continuous phase; establishing a zone of high shear, equivalent to the shear that would be imparted to the mixture adjacent the outside edges of a 1¾ inch diameter radial shrouded turbine impeller rotated in the mixture at about 1400 rotations per minute, within the mixture and near the lower portion of the stripping unit with a high shear mixing device; feeding a stream of the tungsten-bearing acidic liquid organic phase to the zone of high shear and separately feeding the basic aqueous ammonical phase to the mixture while maintaining the aqueous phase as the continuous phase, the organic and aqueous phase being fed to the stripping unit at organic to aqueous volumetric ratios between about 0.5 and about 3, whereby the pH gradient between the organic and aqueous phases is maximized and whereby tungsten values are stripped from the organic phase without precipitating ammonia paratungstate; and withdrawing the mixture from the top of the stripping unit.

4,450,145

PROCESS FOR THE REMOVAL OF SO_2 FROM GAS STREAMS

John E. Klepeis, New Fairfield, Conn., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Oct. 27, 1982, Ser. No. 437,044

Int. Cl.³ C01B *17/00;* B01D *19/00*

U.S. Cl. 423—242 **18 Claims**

1. A process for the removal of SO_2 from two or more gas streams each having a differing SO_2 content which comprises:

(a) providing a flow of lean liquid absorbent for the SO_2 through at least one absorbent zone; and

(b) supplying the gas streams containing the SO_2 to the absorbent flow so that the gas streams are supplied to the flow in ascending order of SO_2 concentration such that each more dilute SO_2-containing stream is supplied to the flow upstream from each more concentrated SO_2-containing stream in order to increase the amount of SO_2 absorbed by the absorbent flow.

4,450,146

HEAT RECOVERY IN P_2O_5 PRODUCTION PROCESS

John E. Klepeis, New Fairfield, Conn., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Sep. 30, 1982, Ser. No. 430,088

Int. Cl.³ C01B *15/16, 25/01, 25/02*

U.S. Cl. 423—304 **5 Claims**

1. A process for the manufacture of phosphorus pentoxide wherein heat valuse are recovered comprising the steps of:

(a) burning elemental phosphorus in the air to produce P_2O_5 containing combustion gases

(b) allowing the hot combustion gases to pass through at least one fluidized bed containing inert, high melting point solid particles whereby the solid particles are heated

(c) recovering the P_2O_5 containing combustion gases, and

(d) contacting the heated bed particles with water to produce steam and thereby recover heat values.

4,450,147

PROCESS FOR MAKING ALKALI METAL HYPOPHOSPHITE SOLUTIONS

Georg Elsner, Hürth-Knapsack, and Hermann Hack, Erftstadt, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Feb. 8, 1983, Ser. No. 464,984

Claims priority, application Fed. Rep. of Germany, Mar. 4, 1982, 3207716

Int. Cl.³ C01B *25/12, 25/165*

U.S. Cl. 423—304 **5 Claims**

5. A method for oxidizing PH_3 produced as a byproduct of the reaction which occurs in the reaction mixture comprising yellow phosphorus and an alkaline aqueous solution, said method comprising the steps of:

adding hydrogen peroxide to said reaction mixture to oxidize the PH_3 substantially as it is formed in said reaction mixture, whereby substantially no PH_3 escapes from said reaction mixture, and

permitting alkali metal hypophosphite to form in said reaction mixture as a result of the oxidizing of the PH_3.

4,450,148

PREPARATION OF MANGANITE, MNOOH

Jay Y. Welsh, Catonsville, Md., assignor to Chemetals Incorporated, Baltimore, Md.

Filed Sep. 30, 1982, Ser. No. 428,539

Int. Cl.³ C01G *45/02*

U.S. Cl. 423—605 **4 Claims**

1. A process for preparing alkali and alkaline-earth free manganite, comprising the steps of:

contacting an aqueous solution containing manganese (II) nitrite with an active surface to promote the formation of manganite,

heating said aqueous solution containing manganese (II) nitrite to a temperature sufficient to effect formation of manganite, and

decomposing said aqueous solution containing manganese (II) nitrite to form an alkali and alkaline-earth free manganite having a high surface area.

4,450,149

RADIOHALOGENATION METHOD

George W. Kabalka, Knoxville, Tenn., assignor to Research Corporation, New York, N.Y.

Filed Jun. 15, 1981, Ser. No. 273,858

Int. Cl.³ A61K *43/00, 49/00*

U.S. Cl. 424—1.1 **29 Claims**

1. A method of radiohalogenating an organic compound, comprising:

reacting a radiohalide salt with an organoborane compound derived from said organic compound in the presence of a mild oxidizing agent.

4,450,150

BIODEGRADABLE, IMPLANTABLE DRUG DELIVERY DEPOTS, AND METHOD FOR PREPARING AND USING THE SAME

Kenneth R. Sidman, Wayland, Mass., assignor to Arthur D. Little, Inc., Cambridge, Mass.

Continuation-in-part of Ser. No. 896,552, Apr. 14, 1978, abandoned, which is a continuation-in-part of Ser. No. 596,444, Jul. 16, 1975, which is a continuation-in-part of Ser. No. 361,182, May 17, 1983, abandoned. This application May 11, 1981, Ser. No. 262,149

Claims priority, application Canada, May 10, 1974, 199552; United Kingdom, May 14, 1974, 21361/74; Switzerland, May 16, 1974, 6744/74; Fed. Rep. of Germany, May 17, 1974, 2424169; Japan, May 17, 1974, 48-54595; France, Nov. 10, 1974, 74 34307

Int. Cl.³ A61K *43/00, 37/24, 9/06*

U.S. Cl. 424—1.1 **28 Claims**

1. A depot suitable for implanting within a living host for the controllable release of at least one substance within said host, said depot not in the form of a film or suture, comprising a matrix structure containing said substance in releasable form said matrix being formed of a poly(glutamic acid-co-ethyl glutamate) in which the mole percent of glutamic acid ranges between about 5 and about 50 and having a viscosity average molecular weight of about 80,000 to about 500,000 and which is hydrophilic and of uniform composition throughout.

2. A depot in accordance with claim 1 wherein said structure is a cylindrical shape.

5. A depot in accordance with claim 2 wherein the concentration of said substance is uniform throughout said rod.

4,450,151

POWDER AEROSOL COMPOSITION

Takahiro Shinozawa, Tokyo, Japan, assignor to Toyo Aerosol Industry Co., Ltd., Tokyo, Japan

Filed Jun. 12, 1979, Ser. No. 47,910

Claims priority, application Japan, Aug. 21, 1978, 53-101559

Int. Cl.³ A61K *9/12*

U.S. Cl. 424—46 **11 Claims**

1. A powder aerosol composition obtained by mixing a suspension comprising 5 to 60 wt % of at least one hydrophobic powdered substance having a pH in the range 5 to 9, 5 to 80 wt % of alcohol whose number of carbon atoms is in the range 1 to 7 and 5 to 80 wt % of water with 5 to 40 wt % of a propellant having a specific gravity lower than that of said suspension, the resulting suspension having a pH in the range of 5 to 9 and a viscosity in the range of 50 to 1000 cps.

4,450,152
COMPOSITION USED TO GROOM HAIR

Isao Ona; Asao Harashima; Masaru Ozaki, and Yoichiro Taki, all of Chiba, Japan, assignors to Toray Silicone Company, Ltd., Tokyo, Japan

Filed Jun. 10, 1982, Ser. No. 386,860
Claims priority, application Japan, Oct. 29, 1981, 56-173253
Int. Cl.³ A61K 7/06, 7/08, 7/15
U.S. Cl. 424—70 4 Claims

1. A hair grooming composition consisting essentially of 0.01 to 10 percent by weight of an organopolysiloxane having at least one alkylamino substituent having the general formula

$$-R'(NHCH_2CH_2)_aNR^2R^3$$

wherein R' is a divalent hydrocarbon group, R^2 and R^3 are selected from the group consisting of hydrogen and monovalent hydrocarbon groups, and a has a value of 0 to 5 and at least one substituent selected from the group consisting of oxyalkylene, polyoxyalkylene, and hydroxyalkyl groups, the oxyalkylene and polyoxyalkylene substituents having the general formula

$$-R_b^4O(C_mH_{2m}O)_cR^5$$

wherein R^4 is a divalent hydrocarbon group, R^5 is selected from the group consisting of hydrogen and end-blocking groups, b has a value of 0 to 1, m has a value of 1 to 5, and c has a value of 1 to 100, and the hydroxyalkyl substituent having the general formula R^4OH wherein R^4 is a divalent hydrocarbon group, said organopolysiloxane having a viscosity range of 1 to 100,000 centistokes at 25° C. and a carrier selected from the group consisting of an aqueous solution, an emulsion and an organic solvent.

4,450,153
ALCOHOL REMOVAL FROM BLOOD WITH ALCOHOL OXIDASE

Thomas R. Hopkins, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Sep. 30, 1982, Ser. No. 429,758
Int. Cl.³ A61K 37/48
U.S. Cl. 424—94 39 Claims

1. A process for reducing the alcohol content of human blood comprising contacting said alcohol with the enzyme alcohol oxidase wherein said alcohol oxidase, present in an injectable solution, is injected into the human body in the amount from about 1 to about 100 mg/Kg of body weight of the recipient.

4,450,154
ANTITUMOR HYBRID AND PROCESS FOR THE PREPARATION THEREOF

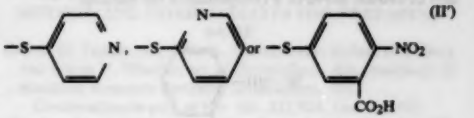
Yasuhiko Masuho, Hino, and Takeshi Hara, Hachioji, both of Tokyo, Japan, assignors to Teijin Limited, Tokyo, Japan

Division of Ser. No. 170,332, Jul. 21, 1980, Pat. No. 4,350,626.
This application Dec. 21, 1981, Ser. No. 333,214
Claims priority, application Japan, Jul. 20, 1979, 54-91634
Int. Cl.³ C07G 7/00; A61K 37/00; C07C 103/52
U.S. Cl. 260—112 R 3 Claims

1. A process for preparing an antitumor protein hybrid which is expressed by the following formula (II'), which process comprises reacting the substantial fragment Fab of an antitumor immunoglobin which has at least one S-sulfo radical or an active disulfide radical expressed by the following formula (V) with the subunit A of ricin which has at least one thiol radical in the fragment:

$$-S-Z \quad (V)$$

where Z indicates



(II')

$$Fab+S_1-S_2-RA)_m$$

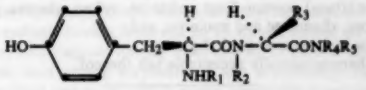
wherein Fab indicates a moiety which is substantially the fragment Fab of an antitumor immunoglobulin; RA indicates a moiety which is the subunit A of ricin; S_1 and S_2 are both sulfur atoms, S_1 indicating a sulfur atom arising from the disulfide bond in the immunoglobulin and S_2 a sulfur atom arising from the disulfide bond in ricin; and m represents an integer of 1 to 5.

4,450,155
ANALGESIC DIPEPTIDE AMIDES AND METHOD OF USE AND COMPOSITIONS THEREOF

Barry A. Morgan, Albany, N.Y., assignor to Sterling Drug Inc., New York, N.Y.

Continuation-in-part of Ser. No. 286,672, Jul. 24, 1981, abandoned. This application Sep. 24, 1982, Ser. No. 423,054
Int. Cl.³ A61K 37/00; C07C 103/52
U.S. Cl. 424—177 13 Claims

1. 2-(L-N^2-R_1-N-R_2-tyrosylamino)-2-R_3-N-R_4-N-R_5-acetamide having the structural formula



wherein

R_1 is hydrogen, alkyl of one to five carbon atoms, allyl, cyclopropylmethyl, formyl, acetyl or propionyl;

R_2 taken together with R_3 is dimethylene, trimethylene or tetramethylene;

R_4 is $(CH_2)_nY$, wherein n is an integer from 2 through 10 and Y is phenyl or phenyl substituted by fluoro, chloro, methyl or methoxy; and

R_5 is hydrogen, alkyl of one to five carbon atoms or $(CH_2)_nY$ as defined for R_4;

or a pharmaceutically acceptable acid addition salt thereof.

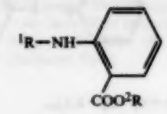
4,450,156
PHARMACEUTICAL COMPOSITION CONTAINING A DERIVATIVE OF ORTHO-AMINOBENZOIC ACID AS AN ACTIVE INGREDIENT

Chikao Yoshikumi, No. 2-19-46, Higashi, Kunitachi-shi, Tokyo; Yoshio Ohmura, No. 5-48-3, Maebara-Higashi, Funabashi-shi, Chiba-ken; Fumio Hirose, No. 2-3-9, Zenpukuji, Suginami-ku, Tokyo; Masanori Ikuzawa, No. 1-25-20, Wakaba-cho, Tachikawa-shi, Tokyo; Kenichi Matsunaga, No. 3-26-1, Hyakunin-cho, Shinjuku-ku, Tokyo; Takayoshi Fujii, No. 5-11-21, Towa, Adachi-ku, Tokyo; Minoru Ohhara, No. 19-25, Fujimi-cho, Itabashi-ku, Tokyo, and Takao Ando, No. 5-31-1, Matsubara, Setagaya-ku, Tokyo, all of Japan

Division of Ser. No. 84,467, Oct. 12, 1981, Pat. No. 4,322,409, which is a continuation-in-part of Ser. No. 24,092, Mar. 26, 1977, abandoned. This application Aug. 20, 1981, Ser. No. 294,502
The portion of the term of this patent subsequent to Apr. 3, 2001, has been disclaimed.
Int. Cl.³ A61K 31/70
U.S. Cl. 424—180 15 Claims

1. A pharmaceutical composition in dosage unit form which comprises a dosage effective for the treatment of hypertension, hyperglycemia, hyperlipemia, inflammatory disease, pain due

to the accentuation of central nerve, pyrexia due to accentuation of central nerve of a compound of the formula:



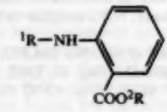
wherein

^{1}R denotes one member selected from the group consisting of the residual groups formed by removing OH at 1(alpha) or 1(beta) position from arabinose, xylose, glucose, galactose, rhamnose and mannose, and

^{2}R is hydrogen or methyl group,

or a pharmaceutically acceptable salt thereof; and a carrier or a diluent therefor.

15. A method for the treatment of hyperglycemia, which comprises administering to a mammal suffering from hyperglycemia an effective amount of a compound of the formula:



wherein

^{1}R denotes one member selected from the group consisting of the residual groups formed by removing OH at 1(alpha) or 1(beta) position from arabinose, xylose, glucose, galactose, rhamnose and mannose, and

^{2}R is hydrogen or methyl group,

or a pharmaceutically acceptable salt thereof.

4,450,157
THIAZOLINE DERIVATIVES

Christoph Lüthy, Schwerzenbach, Switzerland, assignor to Hoffmann-La Roche Inc., Nutley, N.J.

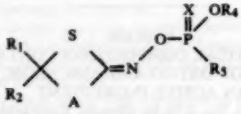
Filed Jun. 11, 1982, Ser. No. 387,305

Claims priority, application Switzerland, Jun. 19, 1981, 4072/81; Apr. 14, 1982, 2257/82

Int. Cl.^{3} A01N *57/16*; C07F *9/65*

U.S. Cl. 424—200 **19 Claims**

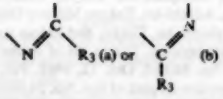
1. A compound of the formula



I

wherein

A is a group



R_1 and R_2 are hydrogen, lower alkyl or cycloalkyl, or together with the carbon atom to which they are attached area 4- to 6-membered, saturated hydrocarbon ring,

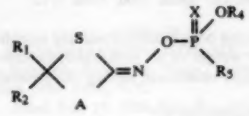
R_3 is lower alkyl, cycloalkyl or lower alkylthio,

X is oxygen or sulfur,

R_4 is lower alkyl,

R_5 is lower alkoxy, lower alkylthio, lower alkenylthio, lower alkynylthio, lower alkylamino or di (lower alkyl) amino, with the proviso that R_1, R_2 and R_3 are lower alkyl groups when A represents a group (b).

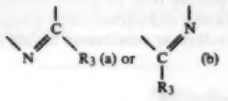
12. A pesticidal composition which comprises an inert carrier material and, as the active ingredient, an amount which is effective as a pesticide of a compound of the formula



I

wherein

A is a group



R_1 and R_2 are hydrogen, lower alkyl or cycloalkyl, or together with the carbon atom to which they are attached are a 4- to 6-membered, saturated hydrocarbon ring,

R_3 is lower alkyl, cycloalkyl or lower alkylthio,

X is oxygen or sulphur,

R_4 is lower alkyl,

R_5 is lower alkoxy, lower alkylthio, lower alkenylthio, lower alkynylthio, lower alkylamino or di(lower alkyl) amino, with the proviso that R_1, R_2 and R_3 are lower alkyl groups when A represents a group (b).

4,450,158
S-TERTIARY ALKYL PHOSPHOROAMIDODITHIOATE PESTICIDES

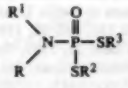
Mohamed A. H. Fahmy, Princeton, N.J., assignor to FMC Corporation, Philadelphia, Pa.

Filed May 13, 1982, Ser. No. 377,651

Int. Cl.^{3} A01N *57/28*; C07F *9/44*

U.S. Cl. 424—220 **6 Claims**

1. An S-tertiary alkyl phosphoroamidodithioate of the formula



in which

R and R^1 are alkyl groups of 1 to 4 carbon atoms,

R^2 is a tertiary butyl or pentyl group, and R^3 differs from R^2 and is a straight or branched chain alkyl group of 1 to 6 carbon atoms or a cyclic alkyl group of 5 or 6 carbon atoms.

2. A method for controlling soil-borne insects and nematodes which comprises applying to plant roots or to the soil in which plants are planted or are to be planted an insecticidally and nematicidally effective amount of the compound of claim 1.

4,450,159

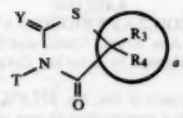
CARBAMIC ACID DERIVATIVES AS SELECTIVE IMMUNOSUPPRESIVE AGENTS

David J. Anderson, Kalamazoo, and Barbara E. Loughman, Richland, both of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

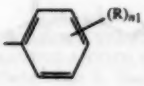
Filed Aug. 8, 1979, Ser. No. 64,783
Int. Cl.³ A61K *31/54, 31/425*
U.S. Cl. 424—246 16 Claims

1. A method of treating a mammal exhibiting allographic rejection phenomena from tissue transplantation which comprises:

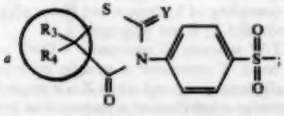
systemically administering to said mammal in a pharmaceutically acceptable dosage form a compound selected from the group consisting of:



wherein T is selected from the group consisting of hydrogen; lower alkyl, of from one to four carbon atoms, amino; carboxybenzylideneamino; chlorobenzylideneamine; anilino; α-alkylbenzyl with alkyl of from one to four carbon atoms, inclusive; cycloalkyl, and



wherein R is selected from the group consisting of hydrogen; alkyl, of from one to four carbon atoms, inclusive; alkoxy, of from one to four carbon atoms; thioalkoxy, of from one to four carbon atoms, inclusive; alkylcarbonyl, with alkyl of from one to four carbon atoms, inclusive; acyloxy with acyl of from one to four carbon atoms, inclusive; nitro; acylamino of from one to four carbon atoms, inclusive; and



wherein

a is the integer one and R_3 and R_4 are different and are selected from the group consisting of hydrogen, methyl, carboxymethyl, ethoxymethylene, and indanylmethylene such that at least one selection is hydrogen,

wherein n_1 is an integer of from one to three;

wherein Y is sulfur; in not less than a non-toxic amount effective to prolong the viability of the transplanted tissue.

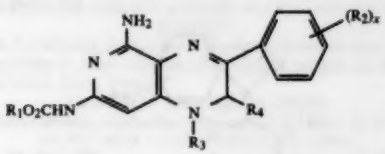
4,450,160

1,2-DIHYDROPYRIDO[3,4-b]-PYRAZINES AND METHOD AND INTERMEDIATES FOR PREPARING SAME

Carroll G. Temple, Jr.; John A. Montgomery; Robert D. Elliott, and Glynn P. Wheeler, all of Birmingham, Ala., assignors to Southern Research Institute, Birmingham, Ala.

Continuation-in-part of Ser. No. 327,928, Dec. 7, 1981, abandoned, which is a continuation-in-part of Ser. No. 247,158, Mar. 24, 1981, abandoned. This application Mar. 3, 1982, Ser. No. 354,164
Int. Cl.³ C07D *471/04, 213/75*
U.S. Cl. 424—250 12 Claims

1. A 1,2-dihydropyrido[3,4-b]pyrazine having the formula:



wherein x has a value of 1,2 or 3, R_1 is a lower alkyl group, R_2 is a member selected from the group consisting of hydrogen, alkyl radicals having from one to 12 carbon atoms, alkenyl radicals having from two to 15 carbon atoms, cycloalkyl radicals having from three to 20 carbon atoms, aralkyl and alkaryl radicals having from seven to 20 carbon atoms, a halogen radical, provided that when x has a value of 1 and R_2 is in the para position and R_3 and R_4 are both hydrogen, R_2 is not chlorine; hydroxyl, amino, alkoxy, aryloxy, carboxyl, alkylcarboxyl radicals having from one to 10 carbon atoms, alkylthio and arylthio radicals having from one to 20 carbon atoms, a sulfonic acid group, alkylsulfonyl and arylsulfonyl radicals having from one to 20 carbon atoms, alkylsulfinyl and arylsulfinyl radicals having from one to 20 carbon atoms, alkylamino and aryl- amino radicals having from one to 20 carbon atoms, and, when taken together with the aromatic ring to which it is attached, naphthyl; and R_3 and R_4 are either both hydrogen or one is hydrogen and the other is a lower alkyl group; and pharmaceutically acceptable salts thereof.

12. A pharmaceutical composition in dosage unit form comprising an amount of a compound as defined by claim 1 effective to treat fungal diseases in association with a pharmaceutical carrier.

4,450,161

PYRIMIDONE SALT AND ITS PREPARATION

George R. White, Harpenden, England, assignor to Smith Kline & French Laboratories Limited, Welwyn Garden City, England

Filed May 26, 1982, Ser. No. 382,027
Int. Cl.³ C07D *403/12;* A61K *31/505*
U.S. Cl. 424—251 7 Claims

1. 2-[2-(5-Methyl-4-imidazolylmethylthio)ethylamino]-5-[5-(1,3-benzodioxolyl)methyl]-4-pyrimidone di(methanesulphonate).

4,450,162
PYRIMIDINE DERIVATIVES AND A PHARMACEUTICAL COMPOSITION CONTAINING THEM

Toshiharu Kamioka; Isao Nakayama, both of Hiromachi; Takeo Honda, Ube; Takashi Kobayashi, Ube; Tokio Obata, Ube; Katsutoshi Fujii, Ube; Mikio Kojima, Ube, and Yuji Akiyoshi, Ube, all of Japan, assignors to Sankyo Company, Limited, Tokyo and Ube Industries Limited, Ube, both of, Japan

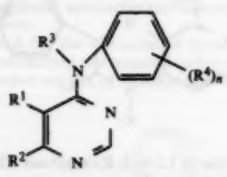
Filed Jun. 2, 1982, Ser. No. 384,416

Claims priority, application Japan, Jun. 5, 1981, 56-86555

Int. Cl.³ A61K *31/505;* **C07D** *239/42*

U.S. Cl. 424—251 **11 Claims**

1. Compounds of formula (I):



(I)

(wherein:

R^1 and R^2 are the same or different and each represents a C_1–C_6 alkyl group or R^1 and R^2 together represent a C_3–C_5 alkylene group;

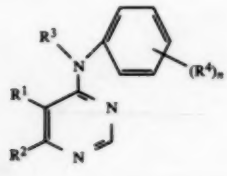
R^3 represents a hydrogen atom or a C_1–C_6 alkyl group;

n is 0, 1 or 2; and

R^4 represents a C_1–C_6 alkyl group, a C_1–C_6 alkoxy group, a C_1–C_6 haloalkyl group, a halogen atom, a nitro group, a C_1–C_6 alkanesulphonyl group, a cyano group, a carboxy group or a C_2–C_7 alkoxycarbonyl group and, when n is 2, the two groups represented by R^4 may be the same or different or they may together represent a methylenedioxy group)

and pharmaceutically acceptable acid addition salts thereof.

8. A pharmaceutical composition comprising an effective amount of an antidepressant compound in admixture with a pharmaceutically acceptable carrier or diluent, wherein the antidepressant compound is selected from compounds of formula (I):



(I)

(wherein:

R^1 and R^2 are the same or different and each represents a C_1–C_6 alkyl group or R^1 and R^2 together represent a C_3–C_5 alkylene group;

R^3 represents a hydrogen atom or a C_1–C_6 alkyl group;

n is 0, 1 or 2; and

R^4 represents a C_1–C_6 alkyl group, a C_1–C_6 alkoxy group, a C_1–C_6 haloalkyl group, a halogen atom, a nitro group, a C_1–C_6 alkanesulphonyl group, a cyano group, a carboxy group or a C_2–C_7 alkoxycarbonyl group and, when n is 2, the two groups represented by R^4 may be the same or different or they may together represent a methylenedioxy group)

and pharmaceutically acid addition salts thereof.

4,450,163
PROCESS FOR THE PREPARATION OF 1,3,7-TRIALKYL XANTHINES AND DI(3,7-DIMETHYLXANTHIN-1-YL)METHANE AS A MEDICAMENT

Georges Philippossian, Lausanne, Switzerland, assignor to Societe d'Assistance Technique pour Produits Nestle S.A., Lausanne, Switzerland

Continuation of Ser. No. 210,785, Nov. 26, 1980, abandoned, which is a continuation-in-part of Ser. No. 148,045, May 8, 1980, abandoned. This application Oct. 2, 1981, Ser. No. 308,039

Claims priority, application Switzerland, May 22, 1979, 4780/79

Int. Cl.³ C07D *473/12;* **A61K** *31/52*

U.S. Cl. 424—253 **3 Claims**

1. Di(3,7-dimethylxanthin-1-yl)methane.

3. A pharmaceutical composition containing an effective quantity of di(3,7-dimethylxanthin-1-yl)methane to produce an immunosuppressant activity.

4,450,164
IMIDAZO[1,2-A]PYRIDINES AND USE

James A. Bristol, Ann Arbor, Mich., and Chester Puchalski, Dover, N.J., assignors to Schering Corporation, Madison, N.J.

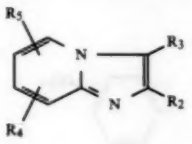
Continuation-in-part of Ser. No. 277,576, Jun. 26, 1981, abandoned, which is a continuation-in-part of Ser. No. 114,473, Jan. 23, 1980, abandoned. This application Dec. 20, 1982, Ser. No. 450,885

Claims priority, application South Africa, Jan. 13, 1981, 81/0219; European Pat. Off., Jun. 21, 1981, 82105411.1

Int. Cl.³ A61K *31/435;* **C07D** *471/04*

U.S. Cl. 424—256 **42 Claims**

1. A compound represented by the formula



I

and the 2,3-dihydro,5,6,7,8-tetrahydro and 2,3,5,6,7,8-hexahydro derivatives thereof, and the pharmaceutically acceptable salts thereof, wherein:

R_2 is hydrogen, lower alkyl or hydroxyloweralkyl;

R_3 is lower alkyl, $—CH_2CN$, hydroxyloweralkyl, —NO, $—CH_2N{=}C$ or

(wherein R_6 and R_7 are independently selected from the group consisting of hydrogen and lower alkyl) or hydrogen, provided R_2 is not hydrogen;

R_4 is Z-T-W wherein Z represents —O—, —NH— or a single bond; T represents a straight or branched chain lower alkylene group and when Z is a single bond, T also represents an ethenylene or a propenylene group wherein the unsaturated carbon is at the single bond and when Z is —O—, T also represents an allylene group wherein the saturated carbon is at the oxygen;

W represents Ar and when T is allylene and Z is —O—, W represents hydrogen;

Ar represents thienyl, pyridinyl, furanyl, phenyl and substituted phenyl wherein there are one or more substituents on the phenyl independently selected from halogen or lower alkyl; and

R_5 is hydrogen, halogen or lower alkyl.

40. A pharmaceutical formulation for use in the treatment of ulcers which comprises a compound of claim 1 in a therapeutically effective amount sufficient to alleviate the symptoms of peptic ulcer disease together with a non-toxic, pharmaceutically acceptable carrier.

4,450,165
DIHYDROPYRIDINE COMPOUNDS

Kazuhiko Araki; Hideki Ao, both of Nakatsu; Tomohiko Kimura, Izumi, and Kenichi Aihara, Yoshitomi, all of Japan, assignors to Yoshitomi Pharmaceutical Industries, Ltd., Osaka, Japan

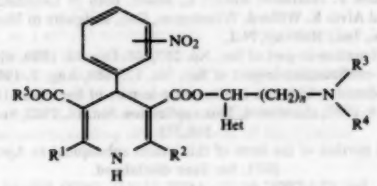
Filed Jun. 4, 1982, Ser. No. 385,141

Claims priority, application Japan, Jun. 4, 1981, 56-86383

Int. Cl.³ A61K *31/47*; C07D *215/58, 213/79*

U.S. Cl. 424—258 **10 Claims**

1. A dihydropyridine compound of the formula:



or a pharmaceutically acceptable acid addition salt thereof, wherein Het is 5- or 6-membered aromatic heteroaryl selected from the group consisting of furyl, thienyl, pyridyl, thiazolyl, oxazolyl, isooxazolyl, pyrrolyl, imidazolyl, pyrimidinyl or 3,4-dihydrocarbostyril, and said heteroaryl being unsubstituted or substituted by a lower alkyl or halogen, R^1 and R^2 are each lower alkyl, R^3 is lower alkyl, R^4 is hydrogen, lower alkyl or aralkyl, R^5 is lower alkyl or aralkyl, and n is 1 or 2.

4,450,166
N-(4,5-DIHYDRO-THIAZOL-2-YL)-3-QUINOLINE-CARBOXAMIDES HAVING ANXIOLYTIC ACTIVITY

Francois Clemence, Paris; Peter F. Hunt, Gonesse; Odile Le Martret, Paris, and Daniel Humbert, Fontenay Sous Bois, all of France, assignors to Roussel Uclaf, Paris, France

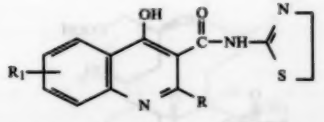
Filed Jun. 9, 1982, Ser. No. 386,597

Claims priority, application France, Jun. 12, 1981, 81 11607; Mar. 15, 1982, 82 04331

Int. Cl.³ A61K *31/47*; C07D *215/56*

U.S. Cl. 424—258 **27 Claims**

1. A compound selected from the group consisting of N-(4,5-dihydro-thiazol-2-yl)-4-hydroxy-3-quinoline-carboxamides of the formula



I

wherein R is selected from the group consisting of hydrogen and alkyl of 1 to 4 carbon atoms and R_1 is selected from the group consisting of hydrogen, halogen, linear alkyl of 1 to 4 carbon atoms, branched alkyl of 3 to 5 carbon atoms, alkoxy of 1 to 4 carbon atoms, CF_3—, CF_3O—, CF_3S— and CH_3S— in the 6- or 7-position and their non-toxic, pharmaceutically acceptable acid addition salts.

10. An anxiolytic composition comprising an anxiolytically effective amount of at least one compound of claim 1 and a pharmaceutical carrier.

19. A method of inducing anxiolytic activity in warm-blooded animals comprising administering to warm-blooded animals an anxiolytically effective amount of at least one compound of claim 1.

4,450,167
3-QUINOLINE CARBOXAMIDES HAVING ANXIOLYTIC ACTIVITY

Odile Le Martret, Paris; Daniel Humbert, Fontenay-sous-Bois, and Peter F. Hunt, Gonesse, all of France, assignors to Roussel Uclaf, Paris, France

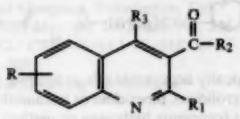
Filed Jul. 15, 1982, Ser. No. 398,575

Claims priority, application France, Jul. 17, 1981, 81 13957

Int. Cl.³ A61K *31/47*; C07D *215/54, 215/56*

U.S. Cl. 424—258 **16 Claims**

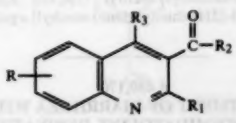
1. A compound selected from the group consisting of 3-quinoline-carboxamides of the formula



wherein R is in 6 or 7-position and is selected from the group consisting of hydrogen, halogen, and alkoxy of 1 to 6 carbon atoms R_1 is selected from the group consisting of hydrogen, alkyl of 1 to 6 carbon atoms, phenyl and benzyl, R_2 is —NHR_4, R_4 is alkyl of 2 to 6 carbon atoms, and R_3 is —OH and their non-toxic, pharmaceutically acceptable acid addition salts.

5. An anxiolytic composition comprising an anxiolytically effective amount of at least one compound of claim 1 and a pharmaceutical carrier.

9. A method of inducing anxiolytic activity in warm-blooded animals comprising administering to warm-blooded animals an anxiolytically effective amount of at least one compound of 3-quinoline-carboxamides of the formula



I

wherein R is in 6- or 7-position and is selected from the group consisting of hydrogen, halogen, alkyl of 1 to 6 carbon atoms, cycloalkyl of 3 to 6 carbon atoms, alkoxy of 1 to 6 atoms, —CF_3, —SCF_3 and CH_3S—, R_1 is selected from the group consisting of hydrogen, alkyl of 1 to 6 carbon atoms, phenyl and benzyl, R_2 is —NHR_4, R_4 is selected from the group consisting of alkyl of 2 to 6 carbon atoms, substituted aryl of 6 to 10 carbon atoms and substituted pyridyl, said substituents being at least one member of the group consisting of halogen, methyl, methoxy, methylthio, trifluoromethyl, trifluoromethylthio, —OH, —NH_2 and alkylamino and dialkylamino of 1 to 6 alkyl carbon atoms with the proviso that when R_4 is a mono substituted aryl or heterocycle, the substituent is different from R of the quinoline when it is a halogen and R_3 is selected from the group consisting of hydrogen and —OH and their non-toxic, pharmaceutically acceptable acid addition salts.

4,450,168
PHARMACEUTICAL COMPOSITIONS CONTAINING COMPOUNDS HAVING ACTION ON HISTAMINE RECEPTORS

David E. Bays, and Roger Hayes, both of Hertfordshire, England, assignors to Glaxo Group Limited, London, England

Continuation of Ser. No. 401,152, Jul. 22, 1982, abandoned. This application Jul. 14, 1983, Ser. No. 513,750

Claims priority, application United Kingdom, Jul. 22, 1981, 8122607

Int. Cl.³ A61K *31/44;* C07D *403/12*

U.S. Cl. 424—267 12 Claims

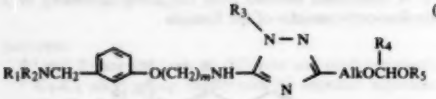
5. A pharmaceutical composition for the treatment of conditions mediated through histamine H_2-receptors comprising an effective amount of a compound selected from

1-methyl-N-[3-[3-(1-piperidinylmethyl)phenoxy]propyl]-3-[(tetrahydro-2-pyranyl)oxymethyl]-1H-1,2,4-triazole-5-amine;

3-[(ethoxymethoxy)methyl]-1-methyl-N-[3-[3-(1-piperidinylmethyl)phenoxy]propyl]-1H-1,2,4-triazole-5-amine;

and physiologically acceptable salts thereof, together with at least one pharmaceutically acceptable carrier or diluent.

7. A compound of the formula (II)



(II)

or a physiologically acceptable salt or hydrate therof in which R_1R_2N is a pyrrolidino, piperidino or hexamethylenimino ring; m is 3 or 4; R_3 represents hydrogen or methyl; Alk represents a straight or branched alkylene chain of 1 to 6 carbon atoms; and R_4 represents a hydrogen atom and R_5 represents a C_{1-4} alkyl group; or R_4 and R_5 together with the atoms to which they are attached form a tetrahydropyranyl ring.

4,450,169
INSECTICIDAL ESTERS

Francois Nezot, Thiais; Pierre Girault, Paris; Jean Tessier, Vincennes, and Jacques Martel, Bondy, all of France, assignors to Roussel Uclaf, Paris, France

Filed Feb. 25, 1982, Ser. No. 352,257

Claims priority, application France, Feb. 26, 1981, 81 03831

Int. Cl.³ C07D *417/12;* A61K *31/425;* C07D *277/30, 277/34*

U.S. Cl. 424—270 3 Claims

1. (2-benzyl-5-thiazolyl)-methyl (1R,3S) 2,2-dimethyl-3-[(dihydro-2-oxo-3-(2H)-thienylidene)-methyl]-cyclopropane-1-carboxylate.

4,450,170
TREATMENT OF DIARRHOEA WITH 2-AMINOIMIDAZOLINE DERIVATIVES

Lee J. Beeley, Dorking, and Peter M. Newsome, Worcester Park, both of England, assignors to Beecham Group Limited, England

Filed Jun. 24, 1981, Ser. No. 277,034

Claims priority, application United Kingdom, Jul. 9, 1980, 8022407; Feb. 20, 1981, 8105339

Int. Cl.³ A61K *31/415*

U.S. Cl. 424—273 R 7 Claims

2. A mehthod for treating diarrhoea in animals including man, which comprises administering an effective, non-toxic amount of p-amino clonidine or a pharmaceutically acceptable N-carboxylic acid acyl derivative and/or pharmaceutically acceptable acid addition salt thereof, to an animal, including man, suffering from diarrhoea.

4. A method for treating diarrhoea in animals including man, which comprises administering an effective, non-toxic amount of a compound of formula (I):

A—B—C (I)

wherein

A is 2-imidazolinyl optionally substituted on a nitrogen atom with C_{1-4} alkyl;

B is NR^3, where R^3 is C_{1-4} alkyl or hydrogen; and

C is phenyl being substituted by unsubstituted guanidino or guanidino substituted by one or more C_{1-4} alkyl; said phenyl being optionally substituted by one or two groups, each selected from halogen, (C_{1-4}) alkyl, (C_{1-4}) alkoxy and hydroxy;

or a pharmaceutically acceptable N-carboxylic acid acyl derivative and/or pharmaceutically acceptable acid addition salt thereof, to an animal, including man, suffering from diarrhoea.

4,450,171
ANTIHYPERCHOLESTEROLEMIC COMPOUNDS

William F. Hoffman; Robert L. Smith, both of Lansdale, Pa., and Alvin K. Willard, Wilmington, Del., assignors to Merck & Co., Inc., Rahway, N.J.

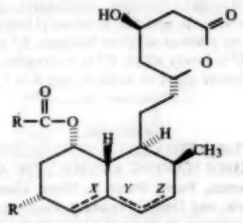
Continuation-in-part of Ser. No. 217,640, Dec. 18, 1980, which is a continuation-in-part of Ser. No. 175,460, Aug. 5, 1980, abandoned, which is a continuation-in-part of Ser. No. 118,051, Feb. 4, 1980, abandoned. This application Jun. 14, 1982, Ser. No. 388,372

The portion of the term of this patent subsequent to Apr. 24, 2001, has been disclaimed.

Int. Cl.³ C07C *69/74;* A61K *31/335;* C07D *309/30*

U.S. Cl. 424—279 9 Claims

1. A compound of the formula:



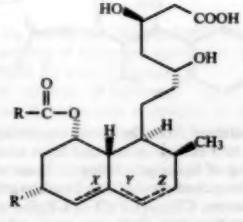
wherein

R' is H or CH_3;

R is 1-ethyl-1-methylpropyl, 1,1-diethylpropyl, 1,1-dimethyethyl, or 1,1-diethylbutyl,

the dotted lines at X, Y and Z represent possible double bonds, said double bonds, when any are present, being either X and Z in combination or X, Y or Z alone; or

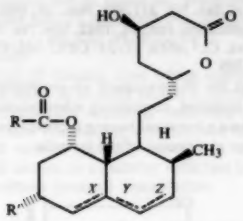
the corresponding dihydroxy acid of the formula:



or a pharmaceutically acceptable salt of said acid, a C_{1-4}alkyl ester of said acid, a phenyl- dimethylamino-, or acetylamino-substituted-C_{1-4} alkyl ester or α-monoglyceride of said acid.

4. A pharmaceutical antihypercholesterolemic composition

comprising a pharmaceutical carrier and an antihypercholesterolemic effective amount of a compound of structural formula:



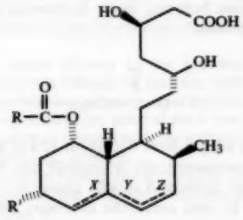
in which

R′ is H, or CH_3;

R is 1-ethyl-1-methylpropyl, 1,1-diethylpropyl, 1,1-dimethyethyl, or 1,1-diethylbutyl,

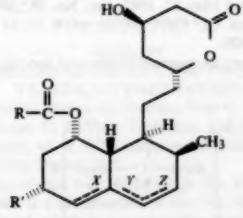
the dotted lines at X, Y and Z represent possible double bonds, said double bonds, when any are present, being either X and Z in combination or X, Y or Z alone; or

the corresponding dihydroxy acid of the formula:



or a pharmaceutically acceptable salt of said acid, a C_{1-4}alkyl ester of said acid, a phenyl- dimethylamino-, or acetylamino-substituted-C_{1-4} alkyl ester or α-monoglyceride of said acid.

7. A method of treating hypercholesterolemia in a patient in need of such treatment which comprises administration of an antihyperchloesterolemic effective amount of a compound of structural formula:



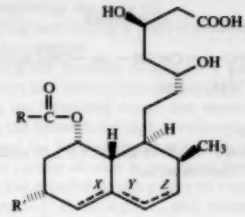
wherein

R′ is H or CH_3;

R is 1-ethyl-1-methylpropyl, 1,1-diethylpropyl, 1,1-dimethyethyl, or 1,1-diethylbutyl,

the dotted lines at X, Y and Z represent possible double bonds, said double bonds, when any are present, being either X and Z in combination or X, Y or Z alone; or

the corresponding dihydroxy acid of the formula:



or a pharmaceutically acceptable salt of said acid, a C_{1-4}alkyl ester of said acid, a phenyl- dimethylamino-, or acetylamino-substituted-C_{1-4} alkyl ester or α-monoglyceride of said acid.

4,450,172

ANTIHYPERTENSIVE POLYHALOHYDROXYISOPROPYL PHENYLALKA(E)NOIC ACID ESTERS OF ALKYLAMINOHYDROXYPROPYLOXYPHENYLALKYL ALCOHOLS

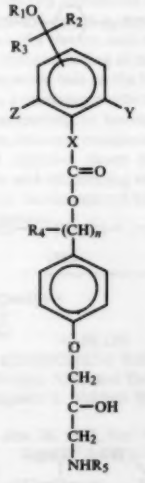
Sung-eun Yoo, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Mar. 10, 1982, Ser. No. 356,712

Int. Cl.³ C07C *69/612, 69/618;* A61K *31/235*

U.S. Cl. 424—309 **12 Claims**

1. A compound having the formula:



(I)

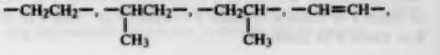
wherein

R_1 is H, alkyl of 1–6 carbon atoms, acyl of 2–12 carbon atoms, benzoyl, benzyl, or benzyl or benzoyl monosubstituted with CN, OCH_3 or Cl;

R_2 and R_3 are independently CF_3, CF_2Cl or CF_2H;

Y and Z are independently H, NO_2, alkoxy of 1–3 carbon atoms, alkylthio of 1–3 carbon atoms, halo(Cl, Br, F), dialkylamino of 1–3 carbon atoms, alkyl of 1–4 carbon atoms, or CF_3;

X is



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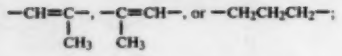
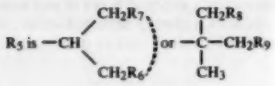


n is 0, 1, 2, or 3;

R_4 is H, alkyl of 1–7 carbon atoms, CF_3, or aralkyl where the alkyl is 1–7 carbon atoms;

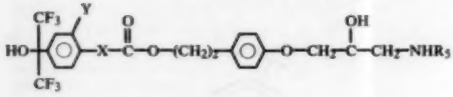


where

R_6, R_7, R_8 and R_9 are independently H, alkyl of 1–4 carbon atoms, phenyl, phenyl monosubstituted with CN, OCH_3 or Cl, benzyl, or benzyl monosubstituted with CN, OCH_3 or Cl; or

R_6 and R_7 taken together are $(CH_2)_m$ where m is 0, 1, 2 or 3; or a pharmaceutically acceptable salt thereof.

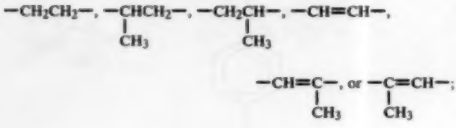
10. A compound of the formula:



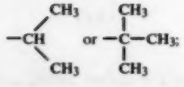
wherein

Y is N or NO_2;

X is



R_5 is



a pharmaceutically acceptable salt thereof.

11. A pharmaceutical composition consisting essentially of an antihypertensive amount of a compound of claim **1** or claim **2** or claim **3** or claim **4** or claim **5** or claim **6** or claim **7** or claim **8** or claim **9** or claim **10** and a pharmaceutically acceptable carrier.

12. A method of treating hypertension in a mammal consisting essentially of administering to a hypertensive mammal an antihypertensive amount of a compound of claim **1** or claim **2** or claim **3** or claim **4** or claim **5** or claim **6** or claim **7** or claim **8** or claim **9** or claim **10**.

4,450,173

COMPOUNDS AND METHOD FOR TREATMENT OR PROPHYLAXIS OF CARDIAC DISORDERS

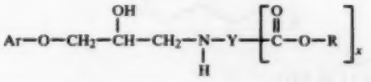
Paul W. Erhardt, and Robert J. Borgman, both of Mundelein, Ill., assignors to American Hospital Supply Corporation, Evanston, Ill.

Continuation of Ser. No. 211,340, Nov. 28, 1980, abandoned. This application Jun. 21, 1982, Ser. No. 390,629

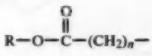
Int. Cl.[3] **A61K** *31/24;* **C07C** *101/42*

U.S. Cl. 424—309 **20 Claims**

1. A method for the treatment or prophylaxis of cardiac disorders in a mammal, comprising administering by intravenous infusion into a mammal having a critical cardiac illness a β-blocking ester compound of the formula



wherein Y is a straight or branched carbon chain of from 1 to about 10 carbon atoms or aralkyl of from 8 to about 20 carbon atoms; R is lower alkyl, lower alkenyl, lower alkynyl, aryl or aralkyl; x is an integer from 1 to about 3, provided that when x is greater than 1, different occurrences of the —COOR group may be the same or different; Ar is phenyl or naphthyl, optionally additionally substituted with lower alkyl, lower alkenyl, lower alkynyl, lower alkoxy, halogen, acetamido, amino, nitro, lower alkylamino, hydroxy, lower hydroxyalkyl, cyano or a group of the formula



wherein n is an integer from 0 to about 10 and R is as defined above; or a pharmaceutically acceptable salt thereof; which β-blocking ester compound rapidly converts to inactive metabolites upon in vivo enzymatic cleavage; wherein said β-blocking ester compound is intravenously infused at a rate sufficient to establish an effective β-blockade in said mammal, and said infusion is then terminated to effect substantial recovery of said mammal from the β-blocking effects of said compound.

4,450,174

DECYL QUATERNARY AMMONIUM COMPOUNDS

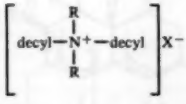
Harold A. Green, Havertown, Pa.; Alfonso N. Petrocci, Glen Rock, and Zdzislaw W. Dudzinski, Clifton, both of N.J., assignors to Millmaster Onyx Group, Inc., New York, N.Y.

Filed May 27, 1982, Ser. No. 382,399

Int. Cl.[3] **C07C** *87/30;* **A61K** *31/14*

U.S. Cl. 424—329 **16 Claims**

1. A quaternary ammonium compound having the structural formula



wherein R is a lower alkyl group of from 1 to 4 carbon atoms, and X is either a halogen having an atomic weight greater than 30, methosulfate or ethosulfate, the term decyl referring to a mixture of primary branched chain alkyl groups, each of which has 10 carbon atoms and consists of a straight chain having at least two branches.

8. A method of inhibiting bacteria in an aqueous solution

which comprises applying to said bacteria an inhibitorally effective amount of the compound of claim 1.

4,450,175

METHOD AND COMPOSITIONS FOR TREATING ACNE

Thelma G. Warshaw, 519 E. Broad St., Westfield, N.J. 07960

Filed Sep. 23, 1982, Ser. No. 422,293
Int. Cl.³ A61K *31/04*
U.S. Cl. 424—349 5 Claims

1. The method of treating acne which comprises applying topically to the locus of an acne papule a composition having a therapeutic component consisting essentially of an nitrate or nitrite having local vasodilating activity, said nitrate or nitrite being admixed with a topically acceptable and compatible pharmaceutical carrier, in a quantity sufficient to effect topical vasodilation without systemic vasodilation.

4,450,176

METHOD OF TREATING SOYBEAN MATERIAL

Nancy G. Stahel, Minneapolis, Minn., assignor to Land O'-Lakes, Inc., Arden Hills, Minn.

Filed Aug. 23, 1982, Ser. No. 410,351
Int. Cl.³ A23L *1/20*; A23K *1/18*
U.S. Cl. 426—2 15 Claims

1. A process for treating a particulate soybean material, comprising:

mixing a lower alcohol with a proteinaceous soybean material in a ratio that is at least approximately 9 pounds of alcohol to 60 pounds of soybean material in a closed vessel such that

the proteinaceous soybean material/alcohol mixture is fluidized;

introducing steam directly to the proteinaceous soybean material/alcohol mixture to heat the material to a treatment temperature to a maximum of approximately 280° F. thereby vaporizing the alcohol such that the alcohol is placed in intimate contact with the soybean material under superatmospheric pressure;

stopping the steam flow to the proteinaceous soybean material/alcohol mixture after the treatment temperature has been reached;

holding the soybean material/alcohol in a temperature range of approximately 190° F. to 280° F. without further introduction of steam in direct contact with the soybean material and until the soybean material reaches a PDI of approximately less than 10; and

venting the lower alcohol vapors from the enclosed vessel only after the soybean material has reached a PDI of approximately 10 to subatmospheric pressure while holding the temperature of the proteinaceous soybean material above the boiling point of the lower alcohol at the subatmospheric pressure thereby removing substantially all of the lower alcohol from the proteinaceous soybean material.

4,450,177

METHOD OF PRODUCING FROZEN YEAST-LEAVENED DOUGH

Robert W. Larson, Croton-on-Hudson; Wen C. Lou, Yorktown Heights; Vivian C. DeVito, Tuckahoe, and Karen A. Neidinger, Ossining, all of N.Y., assignors to General Foods Corporation, White Plains, N.Y.

Continuation of Ser. No. 248,147, Apr. 30, 1981, Pat. No. 4,406,911, which is a continuation of Ser. No. 164,374, Jun. 30, 1980, abandoned, which is a continuation-in-part of Ser. No. 953,807, Oct. 23, 1978, abandoned. This application Sep. 26, 1983, Ser. No. 535,978
Claims priority, application Canada, Oct. 19, 1979, 338082
The portion of the term of this patent subsequent to Sep. 27, 2000, has been disclaimed.
Int. Cl.³ A21D *8/00*
U.S. Cl. 426—19 4 Claims

1. A method for producing a frozen, proofed yeast-leavened dough which can be placed in an oven in the frozen state and fully baked within about one hour's time after removal from the freezer comprising the steps of:

(a) formulating and mixing a yeast-containing dough under ambient temperature;

(b) fermenting the resultant dough for a period of at least five minutes at a temperature between 20° C. and 30° C.;

(c) dividing the fermented dough into separate portions;

(d) forming the fermented dough portions in a desired shape;

(e) permitting the formed dough pieces to proof such that additional carbon dioxide is generated by the yeast;

(f) freezing the proofed dough pieces to a core temperature of between −1° C. to −25° C. and, thereafter;

(g) storing the frozen dough at a temperature of from −30° C. to −10° C.

4,450,178

METHOD AND A SYSTEM FOR TREATING LARGE STRAW BALES, PARTICULARLY ROUND BALES, WITH AMMONIA OR OTHER LYE AGENTS

Ebbe Korsgaard, Agerövej 14, Karby, Denmark

PCT No. PCT/DK81/00071, 371 Date Mar. 15, 1982, 102(e) Date Mar. 15, 1982, PCT Pub. No. WO82/00235, PCT Pub. Date Feb. 4, 1982
PCT Filed Jul. 14, 1981, Ser. No. 361,913
Claims priority, application Denmark, Jul. 15, 1980, 3048/80
Int. Cl.³ A23K *1/22*
U.S. Cl. 426—69 4 Claims

1. A method of treating compacted straw bales with ammonia or lye comprising loading a compacted bale on a bale handling implement of a tractor, said implement having injection and gripping means including at least one spear, transporting the loaded compacted bale on the bale handling implement of the tractor from a receiving position to a final storage position, and while transporting or loading said bale introducing the ammonia or lye into said compacted bale through at least one spear of said injection means during transporting and loading of the bale, said introducing step includes forcing said injection means into the compacted bale by movement of the bale handling implement.

4,450,179

TWO COMPONENT SOFT CANDY

Walter V. Vink, Purdys, N.Y., and Deborah G. Aldrich, Stamford, Conn., assignors to Nabisco Brands, Inc., Parsippany, N.J.

Filed Jun. 25, 1982, Ser. No. 392,425
Int. Cl.³ A23G *3/00*
U.S. Cl. 426—103 13 Claims

1. A two-component soft candy composition comprising:

a supportive moisture stable shell portion comprising

a hydrophilic component selected from the group consisting of corn syrup, invert sugar, and hydrogenated starch hydrolysates;

a hydrophobic component selected from the group consisting of sugar and hydrogenated sugar, in proportions such that said shell portion has an equilibrium relative humidity of from about 30% to about 70% at a temperature of about 24° C. and the gain and loss of moisture of said shell portion at 24° C. is not more than about 2% by weight; and

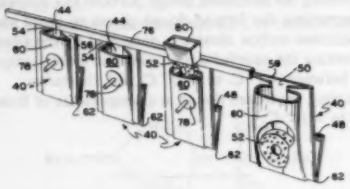
a core portion containing flavoring, sweetening, and coloring ingredients which are hydrophobic in nature.

4,450,180

PACKAGE FOR INCREASING THE VOLUMETRIC YIELD OF MICROWAVE COOKED POPCORN

James D. Watkins, Golden Valley, Minn., assignor to Golden Valley Foods Inc., Eden Prairie, Minn.

Filed Jul. 7, 1980, Ser. No. 166,373
Int. Cl.³ B65D *81/34*; B65B *29/08*
U.S. Cl. 426—107 **7 Claims**



1. A package for shipping and popping popcorn within a microwave oven comprising,

a bag formed from flexible sheet material transparent to microwave energy and having two opposed face panels including a first relatively large face panel with side edges and a second parallel face panel of reduced width including side edges spaced centrally from the side edges of the first panel,

sections of extensible interconnecting folded sheet material defining centrally projecting gussets extending between the side edges of the first and second panels,

a transverse end seal on at least one end of the bag bonding the sheet material together,

a change of popcorn and fat is contained therein intermediate the ends of the bag and spaced apart from said ends,

said charge being located between the centrally projecting gussets and said second face panel,

said centrally projecting gussets approaching each other closely enough to divide the bag into a pair of collateral tubes including a first longitudinally extending tube including said first panel and of a relatively large cross-sectional area and

a second longitudinally extending tube including said second panel and of a smaller cross-section,

the charge of popcorn and fat is confined substantially entirely in the tube of smaller cross-section,

said tubes being in communication with each other between the gussets so that the popcorn can pass from the smaller tube to the larger tube during popping within the bag,

means as part of the bag to temporarily restrain the charge at the center of the bag and in only one tube,

the charge of popcorn and fat confined in the small tube having a broad face adapted to rest adjacent a floor portion of said microwave oven during popping whereby microwave energy is efficiently absorbed to achieve a popped volume on the order of 10% to 15% or more greater than an equivalent package with tubes of equal cross-section.

4,450,181

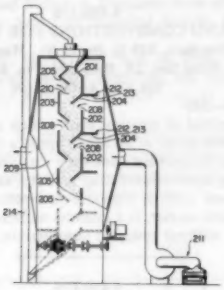
METHOD OF HUMIDIFYING POLISHED RICE

Toshihiko Satake, Higashihiroshima, Japan, assignor to Satake Engineering Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 175,507, Aug. 5, 1980, abandoned. This application May 19, 1983, Ser. No. 496,175
Claims priority, application Japan, Aug. 10, 1979, 54-101284
Int. Cl.³ A23L *1/10*
U.S. Cl. 426—507 **8 Claims**

1. A method of humidifying polished rice, comprising the step of:

adding moisture to the polished rice at a rate to cause the rice to adsorb the moisture progressively so that its moisture content increases gradually and continuously or almost continuously at approximately 0.2 to 0.3 percent by



weight of the polished rice per one hour, until the desired moisture content is achieved.

4,450,182

PROCESS FOR MODIFYING A DAIRY MEDIA FOR USE AS A FOAMING AGENT

Howard D. Stahl, Scarsdale, and Raymond C. Yuan, North Tarrytown, both of N.Y., assignors to General Foods Corporation, White Plains, N.Y.

Filed Dec. 30, 1982, Ser. No. 454,770
Int. Cl.³ A23C *3/04*
U.S. Cl. 426—565 **13 Claims**

1. A process for preparing a frozen foam composition containing a dairy medium and having an extended, thawed, refrigerated storage stability comprising the steps of:

(a) reducing the calcium activity of the dairy medium by at least about 70%;

(b) dispersing the reduced calcium activity dairy medium, an emulsifier, gum, and a carbohydrate in water;

(c) preparing a lipid solution;

(d) combining the aqueous dispersion of step b and the lipid solution of step c so as to form an admixture;

(e) homogenizing said admixture at a pressure in excess of about 6000 psig so as to form an emulsion;

(f) cooling said emulsion to a temperture effective to allow the lipid to crystallize;

(g) whipping and aerating said cooled emulsion to an overrun of at least about 150% by volume; and

(h) freezing said whipped emulsion.

4,450,183

PROCESS FOR MANUFACTURING DRIED MEAT EMULSIONS

Marvin P. Steinberg, 4 O'Connor Ct., Champaign, Ill. 61820, and Theodore S. Lioutas, Urbana, Ill., assignors to Marvin P. Steinberg, Champaign, Ill.

Filed Jun. 18, 1982, Ser. No. 389,590
Int. Cl.³ A23B *4/04*; A23L *1/31*
U.S. Cl. 426—646 **7 Claims**

1. The process for manufacturing a dried meat emulsion in thin sheets readily rehydratable to a product with good meat texture, consisting essentially of the following combination of steps:

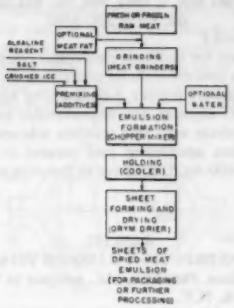
(a) combining finely-divided fat-containing raw meat with added salt (NaCl) and added water or ice to form a mixture convertible into a meat emulsion;

(b) if the pH of said mixture is below 6.0, adjusting the mixture pH to a pH within the range from 6.0 to 8.0 so that the pH of the mixture is similar to the pH of fresh prerigor meat;

(c) converting said raw meat-containing mixture under

shearing conditions into a uniform emulsion paste having a continuous water phase and a dispersed fat phase;

(d) applying said emulsion paste to the exterior surface of an internally heated drum and forming a thin layer thereon; and then



(e) rapidly drying the applied layer on said drum to a moisture content of from 5 to 40% by weight to obtain the dried meat emulsion.

4,450,184

HOLLOW SPHERE CERAMIC PARTICLES FOR ABRADABLE COATINGS

Frank N. Longo, East Northport; Nicholas F. Bader, III, Farmingdale, and Mitchell R. Dorfman, East Meadow, all of N.Y., assignors to METCO Incorporated, Westbury, N.Y.

Filed Feb. 16, 1982, Ser. No. 349,288
Int. Cl.³ B05D *1/10, 5/02*
U.S. Cl. 427—34 **5 Claims**

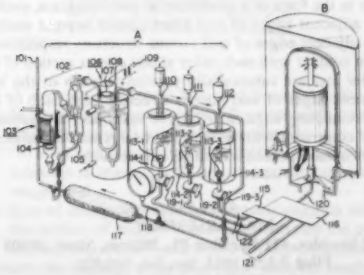
1. A process for producing an abradable porous coating comprising flame spraying hollow spheres made of a refractory metal oxide selected from the group consisting of zirconium oxide and magnesium zirconate where each hollow sphere has a size between about −100 mesh, U.S. standard screen size, and +5 microns.

4,450,185

PROCESS FOR FORMING AMORPHOUS SILICON FILM

Isamu Shimizu, Yokohama; Kyosuke Ogawa, and Eiichi Inoue, both of Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 1, 1982, Ser. No. 353,186
Claims priority, application Japan, Mar. 12, 1981, 56-36266
Int. Cl.³ H01L *45/00*
U.S. Cl. 427—39 **4 Claims**



1. Process for providing a source of gaseous film-forming material capable of forming on a substrate in a deposition chamber, a substantially uniform film over a broad substrate surface area having enhanced photoconductive properties which comprises continuously:

(a) introducing a gaseous source containing silicon into a discharge reaction chamber;

(b) causing a discharge in said chamber in the presence of said gaseous atmosphere sufficient to form a gaseous reaction product having silicon oligomers;

(c) fractionating said gaseous reaction product to separate and collect a gaseous, film-forming material comprising silicon oligomers;

(d) introducing said gaseous film forming material into said deposition chamber and;

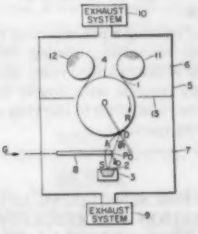
(e) forming a film from said gaseous film-forming material in said deposition chamber.

4,450,186

METHOD AND DEVICE FOR MANUFACTURING MAGNETIC RECORDING MEDIUM

Koichi Shinohara, Hyogo, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Aug. 19, 1982, Ser. No. 409,608
Claims priority, application Japan, Aug. 20, 1981, 56-131176; Sep. 9, 1981, 56-142698; Oct. 9, 1981, 56-161624
Int. Cl.³ B05D *3/06*
U.S. Cl. 427—42 **4 Claims**



1. A method for manufacturing a magnetic recording medium comprising the step of depositing a ferromagnetic material on a polymeric base body which is moved along a cooling support body in a vacuum chamber using an incident angle control mask for controlling a vapor flow, while spraying a gas from the vicinity of an incident angle control portion of said mask.

4,450,187

IMMERSION DEPOSITED CATHODES

Lawrence J. Gestaut, Painesville, Ohio, assignor to Diamond Shamrock Corporation, Dallas, Tex.

Filed Apr. 9, 1982, Ser. No. 366,880
Int. Cl.³ B05D *5/12*; C23C *3/02*
U.S. Cl. 427—125 **16 Claims**

1. A process for the electroless plating of a metal upon a substrate metal comprising the steps of:

selecting a substrate metal capable of adsorbing hydrogen;

interdiffusing surfaces of the substrate metal with a second metal;

leaching a preponderance of the second metal from the interdiffused surface to leave a surface tending to include adsorbed hydrogen; and

immersing the substrate metal into a plating bath containing ions of the metal to be plated upon the substrate.

4,450,188

PROCESS FOR THE PREPARATION OF PRECIOUS METAL-COATED PARTICLES

Shinroku Kawasumi, 5-7-17, Inamuragasaki, Kamakura-shi, Kanagawa Prefecture, Japan

Filed Apr. 7, 1981, Ser. No. 251,746
Claims priority, application Japan, Apr. 18, 1980, 55-51516; Aug. 26, 1980, 55-116482
Int. Cl.³ B05D 7/14, 5/12; H01B 1/02
U.S. Cl. 427—217 8 Claims

1. A process for the preparation of precious metal-coated particles which comprises adding a non-metallic reducing agent to an aqueous suspension containing (A) homogeneously suspended core material particles having a mean diameter of less than 10μ; (B) homogeneously suspended precious metal salts particles; and (C) dissolved precious metal ions, in which the ratio of the amount of the core material against the total amount of the precious metal contained in both forms in the suspension ranges from 1/9 to 7/3, in an aqueous acidic medium having little dissolving capacity for the core material, so as to produce precious metal-coated particles through formation of gelling state which breaks as the coating proceeds, and recovering the so-produced precious metal-coated particles.

4,450,189

METHOD OF TREATING A POLYMERIZING REACTOR

Paul Laroche, and Jean-Bernard Pompon, both of Saint Auban, France, assignors to Chloe Chimie, Puteaux, France

Filed Jun. 14, 1982, Ser. No. 387,924
Claims priority, application France, Jun. 26, 1981, 81 12579
Int. Cl.³ C08F 2/00
U.S. Cl. 427—236 14 Claims

1. A method of treating a polymerizing reactor to minimize polymer build-up comprising coating the internal surfaces within the reactor with a modified rosin, said rosin being chemically modified by reaction with double bonds of the abietic acids present in the rosin, prior to carrying out the polymerization reaction in the reactor.

4,450,190

PROCESS FOR SENSITIZING ARTICLES FOR METALLIZATION AND RESULTING ARTICLES

Francis J. Nuzzi, Freeport; Edward J. Leech, Oyster Bay; Richard W. Charm, Huntington Station, and Joseph Polichette, South Farmingdale, all of N.Y., assignors to Kollmorgen Technologies Corporation, Dallas, Tex.

Continuation of Ser. No. 796,809, May 13, 1977, Pat. No. 4,199,623, which is a continuation of Ser. No. 520,355, Nov. 1, 1974, abandoned, which is a continuation-in-part of Ser. No. 407,555, Oct. 18, 1973, and Ser. No. 270,861, Jul. 11, 1972. This application Oct. 1, 1979, Ser. No. 80,488
The portion of the term of this patent subsequent to Apr. 22, 1997, has been disclaimed.
Int. Cl.³ C23C 3/02
U.S. Cl. 427—304 4 Claims

1. A process for the electroless deposition of metal on a non-metallic surface, said process comprising the steps of:

(a) pre-sensitizing the non-metallic surface to the electroless deposition of metal by contacting said non-metallic surface with a liquid medium comprising an admixture of a polar liquid, a halide, cupric ions and cuprous ions in a weight ratio of cuprous ions to cupric ions of at least 0.4:1;

(b) Rinsing said contacted surface with an aqueous solution and forming an adherent water-insoluble derivative of said liquid medium adsorbed on said non-metallic surface;

(c) treating said rinsed surface with an electroless metal deposition bath containing a reducing agent to render said insoluble derivative catalytic to the electroless deposition of metal; and

(d) contacting said catalytically sensitive surface with an electroless metal deposition bath to form an electroless deposit of metal thereon.

4,450,191

AMMONIUM IONS USED AS ELECTROLESS COPPER PLATING RATE CONTROLLER

Donald A. Arcilesi, Mt. Clemens, Mich., assignor to OMI International Corporation, Warren, Mich.

Filed Sep. 2, 1982, Ser. No. 413,225
Int. Cl.³ C23C 3/02
U.S. Cl. 427—443.1 12 Claims

1. In a process for applying electroless copper plating to a substrate which process includes contacting the substrate with a solution comprising copper, a complexing agent, a reducing agent, and a pH adjuster, the improvement comprising contacting the substrate with said solution wherein said solution further comprises ammonium ions present in an amount of from about 50–600 mg/l, effective to function as a plating rate controller.

4,450,192

CONSTRUCTION BARRIER BOARD

Joseph A. Cogliano, Pasadena, Md., assignor to W. R. Grace & Co., New York, N.Y.

Filed Jul. 28, 1982, Ser. No. 402,747
Int. Cl.³ B32B 1/04, 3/02, 3/12, 11/04
U.S. Cl. 428—40 21 Claims

1. A performed sheet-like barrier consisting essentially of

(a) a substantially rigid, porous, closed-cellular, substantially planar structure having a first and a second major surface and edges defining the dimensions of said structure, said structure having a thickness of from about 0.25 inch to 10 inches;

(b) an adhesive bituminous sheet formed from blends of bituminous material and a natural or synthetic rubber or resin, said sheet having a first and a second major surface and edges defining the dimensions of sheet and having a thickness of at least 0.01 inch, wherein the first major surface of said sheet is in contact with and self adhered to the substantial entire first major surface of said porous structure;

(c) a coating which is substantially non-adherent with respect to said adhesive bituminous sheet, said coating being a removable sheet which is substantially coextensive and congruent with the second major surface of the adhesive bituminous sheet or said coating being a film of substantially non-adherent material applied to at least the substantial entire second major surface of said structure; said porous structure (a) and said sheet (b) are each substantially in the form of a quadrilateral parallelogram, each of two adjacent edges of said sheet extend beyond each of two adjacent edges of said porous structure, respectively, are in contact with each other at one corner section of the barrier and are substantially parallel to each of the two adjacent edges of said porous structure; and each of the two remaining adjacent edges of said sheet are substantially congruent with each of the two remaining adjacent edges of said porous structure, respectively.

4,450,193

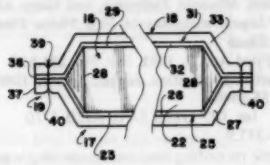
MAT ASSEMBLY

Raymond Staebler, 411 Zanzibar Pl., Billings, Mont. 59105

Filed Jul. 5, 1983, Ser. No. 510,971
Int. Cl.³ B32B 3/06, 3/18
U.S. Cl. 428—71 8 Claims

1. A mat assembly including a pad portion, a base portion, a face portion, a fastening portion and a securing portion; said

pad portion including a foam layer, said foam layer having a thickness between about 3/16th and ¼th of an inch; said base portion being disposed adjacent to a major surface of said foam layer, said base portion including a flexible laminate including a fabric backing layer in contact with said foam layer and an outer plastic layer integral therewith, said base portion having a length and a width slightly larger than said foam layer so that the base portion extends beyond the periphery of said foam layer on all edges thereof; said face portion being disposed adjacent to a major surface of said foam layer opposite to said base portion, said face portion including a flexible laminate including a fabric backing layer in contact with said foam layer



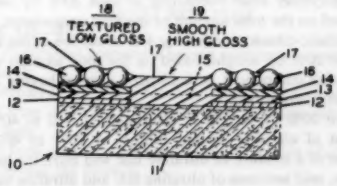
and an outer plastic layer integral therewith, said face portion having a length and a width substantially the same as said base portion and slightly larger than said foam layer with said face portion extending beyond the periphery of said foam layer on all edges thereof, the edges of said face portion being aligned with the edges of said base portion; said fastening portion including means for affixing together the adjacent peripheral sections of said face and base portions that extend beyond the edges of said foam layer; said securing portion including tie means extending from one of the shorter edges of said assembly; whereby said mat assembly can be rolled into a cylindrical configuration when not in use and secured by said tie means to facilitate storage.

4,450,194

DECORATIVE LAMINATE

William J. Kauffman, Lititz, and Ralph W. Wright, Lancaster, both of Pa., assignors to Armstrong World Industries, Inc., Lancaster, Pa.

Filed Jul. 29, 1982, Ser. No. 402,954
Int. Cl.³ B32B *3/00, 5/16*
U.S. Cl. 428—172 **32 Claims**



1. A decorative laminate having differential surface texture and differential gloss suitable as a floor covering comprising

a substrate having a printed image thereon;

PVC resin particles of type GP PVC resin adhered to said substrate in register with at least a portion of said printed image; and

a layer of transparent synthetic organic polymer adhered to the surface of said PVC resin particles and the portion of said substrate intermediate said PVC resin particles;

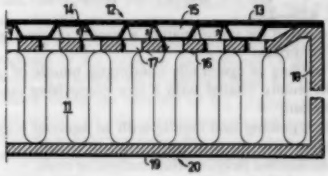
whereby the regions of said decorative laminate overlying said PVC resin particles exhibit a rougher surface texture and a lower gloss than the regions of said decorative laminate intermediate said PVC resin particles.

4,450,195

HYGIENIC ABSORBENT AND USE OF A PLASTIC FOIL IN THE ABSORBENT

Gunnar Hagbjer, Malmö, Sweden, assignor to IFM Akustikbyran AB, Stockholm, Sweden

PCT No. PCT/SE80/00137, 371 Date Dec. 31, 1980, 102(e) Date Dec. 31, 1980, PCT Pub. No. WO80/02580, PCT Pub. Date Nov. 27, 1980
PCT Filed May 9, 1980, Ser. No. 221,693
Claims priority, application Sweden, May 11, 1979, 7904166
Int. Cl.³ B32B *3/12*
U.S. Cl. 428—178 **7 Claims**



1. A hygienic sound absorbent comprising:

a layer of sound absorbing material;

a tight surface layer having at least a portion thereof connected to said layer of sound absorbing material;

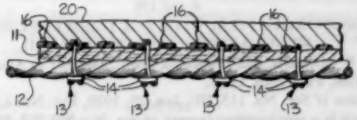
means for defining a plurality of mutually-spaced, gas-filled cushions or blisters located between said tight surface layer and said layer of sound-absorbing material to thereby space said tight-surface layer from said sound-absorbing material, at least a portion of said cushion-defining means being connected to said tight surface layer, at least some of said gas-filled cushions or blisters being sized in accordance with the frequency-range of the sounds that are to be absorbed.

4,450,196

COMPOSITE FUSIBLE INTERLINING FABRIC AND METHOD

Dattatraya V. Kamat, Jenkintown, Pa., assignor to Crown Textile Company, Jenkintown, Pa.

Filed Feb. 17, 1983, Ser. No. 467,238
Int. Cl.³ B32B *3/00*
U.S. Cl. 428—197 **8 Claims**



1. A composite fusible interlining fabric adapted to be fused to a base fabric and characterized by the smooth surface characteristics of nonwoven interlining fabric and the strength, bulk, resiliency, and drapability characteristics of woven and knit interlining fabrics, said interlining fabric comprising a layer of nonwoven fabric of closely compacted fibers, a layer of inlaid weft yarns positioned against one side of said layer of nonwoven fabric, stitch yarn knit through said layer of nonwoven fabric and said layer of inlaid weft yarns and securing said inlaid weft yarns to said layer of nonwoven fabric, and a coating of thermoactive adhesive material on the side of said layer of nonwoven fabric opposite the side against which said layer of inlaid weft yarns is positioned, said coating of thermoactive adhesive material being fusible at a predetermined temperature which is lower than the temperature at which said layer of nonwoven fabric, said layer of inlaid weft yarns, said knit stitch yarn and the base fabric will be adversely affected, so that said composite interlining fabric may be fused to one side of the

base fabric by the application of heat thereto, said layer of nonwoven fabric providing a barrier to prevent strike back of said adhesive coating material when said composite interlining fabric is fused to the base fabric.

4,450,197

POLYTETRAFLUOROETHYLENE-IMPREGNATED BUNDLES OF SIZED GLASS FIBERS

Thomas P. Hager, Reynoldsburg, and Larry W. Ferguson, Newark, both of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Apr. 14, 1982, Ser. No. 368,074

Int. Cl.³ D03D *3/00*; B05D *3/05*

U.S. Cl. 428—232 **5 Claims**

1. A method for impregnating a bundle of sized glass fibers which comprises:

(a) providing an essentially continuous bundle of glass fibers individually coated with a size comprising starch and a lubricant;

(b) impregnating said bundle with an aqueous impregnating composition comprising:

(i) emulsified polytetrafluoroethylene resin,

(ii) emulsified acrylic resin coalesceable to form a coherent film upon drying an aqueous dispersion thereof at temperatures as low as about 10° C.,

(iii) a thickening agent comprising base-solubilized polyacrylic acid, and

(iv) a polyhydrolyzable organosilane having non-hydrolyzable amine functionality and/or hydrolysis and/or condensation products thereof;

(c) drying the bundle containing said impregnating composition to deposit the non-volatile residue thereof in the interstices and on the outer surface of said bundle in contact with the sized glass fibers comprising said bundle.

2. A method according to claim 1 wherein said bundle of sized glass fibers is impregnated by immersion in a body of said aqueous impregnating composition to wet said bundle and then drawing the wetted bundle through a stripper die to remove excess aqueous impregnating composition from the bundle and to enhance penetration of said aqueous impregnating composition into the interstices of said bundle.

3. A method according to claim 1 wherein said size further comprises an acrylic resin, coalesceable to form a coherent film upon drying an aqueous dispersion thereof at temperature as low as about 10° C.

4. An impregnated bundle of glass fibers produced according to the method of claims 1, 2 or 3.

4,450,198

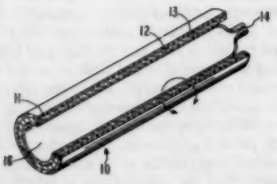
MICROPOROUS FILM WITH POLYMER IN PORES FOR REGULATING PASSAGE OF FLUID

Alan S. Michaels, San Francisco, Calif., assignor to Alza Corporation, Palo Alto, Calif.

Division of Ser. No. 115,750, Jan. 28, 1980, Pat. No. 4,304,232, which is a continuation-in-part of Ser. No. 862,363, Dec. 20, 1977, abandoned. This application Aug. 17, 1981, Ser. No. 293,696

Int. Cl.³ B32B *5/18*

U.S. Cl. 428—315.5 **1 Claim**



1. A microporous film comprising a microporous polymer selected from the group consisting of a microporous polyolefin, polyamide, polycarbonate, polyester, polystyrene, polysulphone, polyimide, polyvinyl chloride, polyaldehyde, polyarylate, polyhaloolefin polyacetyl, polyacrylate, and polyurethane, housing in its micropores a solid polymer selected from the group consisting of polyhydroxylalkyl acrylate, polyhydroxyalkyl methacrylate, polyacrylamide, poly(methacrylamide), polyvinyl pyrrolidone, polyvinyl alcohol, polyvinyl lactam acrylate, and polyvinyl piperidone.

4,450,199

MAGNETIC RECORDING MEDIUM

Eiichi Tadokoro; Masaaki Fujiyama, and Goro Akashi, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Apr. 7, 1981, Ser. No. 251,826

Claims priority, application Japan, Apr. 7, 1980, 55-45408; Apr. 7, 1980, 55-45409

Int. Cl.³ G11B *5/70*; B32B *3/10*

U.S. Cl. 428—317.9 **8 Claims**

1. A magnetic recording medium comprising a nonmagnetic support and a magnetic layer formed thereon, said magnetic layer comprising a magnetic powder and a binder which comprises a thermosetting resin, said magnetic layer having a center-line average surface roughness of not more than $2.1\times10^{-2}\mu$, and at least one property selected from an average particle size of at least 500 Å and a porosity of at least 30%.

4,450,200

COATING COMPOSITION AND COATED ARTICLE

Susumu Iwato, Urayasu; Tatuo Nakamura, and Takeo Kurauchi, both of Tokyo, all of Japan, assignors to Nippon Paint Co., Ltd., Osaka, Japan

Filed Aug. 17, 1982, Ser. No. 408,843

Int. Cl.³ B32B *5/16, 15/08*

U.S. Cl. 428—323 **6 Claims**

1. A multilayer coated article having an intermediate coat derived from a coating composition comprising:

A. at least one polyester resin derived from (1) at least one acid component selected from the group consisting of dibasic acids and the esters and the ester-forming derivatives thereof and (2) at least one alcohol component selected from the group consisting of polyhydric alcohols and the ester-forming derivatives thereof; and

B. at least one aminoplast resin having a number-average molecular weight of 800 to 1400,

said polyester resin containing at least 20% by weight, based on the total amount of the acid component, of an aliphatic dibasic acid having 4 to 10 carbon atoms and at least 20% by weight, based on the total amount of the alcohol component, of a dihydric alcohol having 2 to 6 carbon atoms, and

C. 2% to 20% by weight of ultrafine talc, 2% to 40% by weight of ultrafine barium sulfate, or 20% to 40% by weight of a mixture of ultrafine talc and ultrafine barium sulfate, said amounts of ultrafine talc and ultrafine barium sulfate being based on the total solid amount of said composition,

said polyester resin having a number-average molecular weight of 2000 to 4000, a hydroxyl number of 30 to 75, and an acid number of 5 to 15,

the weight ratio, in terms of a solid content, of the polyester resin to the aminoplast resin being 60/40 to 95/5,

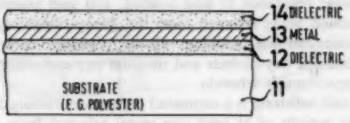
wherein said coated film of said coating composition has an elongation of 20% and a static glass transition temperature of $-10°$ C. to 20° C.

2. A coated article as claimed in claim 1, wherein said ultrafine talc has an average particle diameter of 2μ or less and a particle diameter of at least 90% by weight of the primary particles of less than 5μ.

4,450,201
MULTIPLE-LAYER HEAT BARRIER

Klaus Brill, Korntal, and Wolfgang Grothe, Tiefenbronn, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 283,513, Jul. 15, 1981, abandoned. This application Oct. 13, 1981, Ser. No. 311,065
Claims priority, application Fed. Rep. of Germany, Oct. 22, 1980, 3039821
Int. Cl.³ B32B *15/00*
U.S. Cl. 428—336 21 Claims



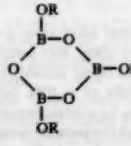
1. Multilayer heat barrier system having:
a transparent substrate;
a transparent metal layer;
at least one transparent layer applied to the side of the metal layer remote from the substrate, constituting an outer dielectric cover layer, said at least one layer comprising a mixture of (1) at least one compound selected from the group consisting of the oxides of titanium, silicon, tantalum and zirconium, zinc sulfide (2) at least one nitrogen compound having the same metal ion as said oxide or sulfide.

4,450,202
TRANSPARENCIES PRODUCED FROM EPOXY RESINS CURED WITH ADDUCTS OF BOROXINES AND INTERLAYERS OF MERCAPTAN RESINS

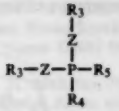
John R. Uram, Jr., Glendale, Ariz., assignor to Goodyear Aerospace Corporation, Akron, Ohio

Division of Ser. No. 232,054, Feb. 5, 1981, Pat. No. 4,343,928, and a continuation-in-part of Ser. No. 204,424, Nov. 6, 1980, Pat. No. 4,352,848, each is a continuation-in-part of Ser. No. 70,390, Aug. 28, 1979, Pat. No. 4,294,886. This application Jul. 1, 1982, Ser. No. 394,205
Int. Cl.³ B32B *27/38*
U.S. Cl. 428—412 2 Claims

1. A transparent composite having resistance to intense heat, comprising:
a transparent layer of a reaction product of a blend having
(a) from about 80 to about 100 parts by weight of an epoxy resin;
(b) from about 5 to about 30 parts by weight of a boroxine having the formula:



where R is a compound having from 1 to 18 carbon atoms, and
(c) from about 1 part to about 40 parts by weight of an organic phosphorus compound having the following formula:



where R_3 is selected from the group consisting of hydrocarbon radicals having from 1 to 24 carbon atoms, halo-substituted organic radicals having from 1 to 24 carbon atoms, and multihalo-substituted organic radicals having from 1 to 24 carbon atoms; and where R_3 may be the same or different radicals;
where R_4 is selected from the group consisting of all the radicals of R_3, oxygen, and radicals of the formula: —O—R_6, where R_6 is selected from the group consisting of all the radicals of R_3, organo-phosphorus polymeric radicals, and organo-phosphorus esters;
where R_5 is selected from the group consisting of hydrogen, hydroxyl, oxygen, sulfur, halogens or no radical at all;
where Z is selected from the group consisting of oxygen, sulfur, or no radical at all; and
where said transparent blend is contiguously sandwiched between transparent materials selected from the group consisting of acrylic, polycarbonate, polyurethane, silicate glass, and combinations thereof, to produce a composite transparency having an inside ply and an outside ply.

4,450,203
ELECTROGRAPHIC COATINGS CONTAINING ACRYLAMIDE COPOLYMERS

Frank J. Ragas, Willow Springs; Ralph L. Minnis, Des Plaines, and Gerson E. Beauchamp, Park Ridge, all of Ill., assignors to DeSoto, Inc., Des Plaines, Ill.

Filed Oct. 4, 1982, Ser. No. 432,683
The portion of the term of this patent subsequent to Jul. 13, 1999, has been disclaimed.
Int. Cl.³ B32B *23/08, 27/10*; B05D *5/12*
U.S. Cl. 428—514 9 Claims

1. Electrically conductive paper coated with an insulating coating comprising an organic solvent-soluble solution copolymer of monoethylenically unsaturated monomers comprising from about 1% to about 8% of copolymerized acrylamide or a monoethylenic derivative thereof in combination with from 4% to 10% of copolymerized monoethylenically unsaturated carboxylic acid including from ¼th to ¾ths of methacrylic acid based on total carboxylic acid monomer.

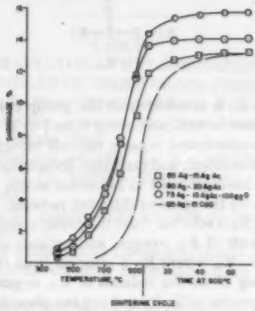
4,450,204
SILVER MATERIAL SUITABLE FOR BACKING OF SILVER-CADMIUM OXIDE CONTACTS AND CONTACTS EMPLOYING SAME

Han J. Kim, Greensburg, and Richard C. Bevington, Delmont, both of Pa., assignors to GTE Products Corporation, Stamford, Conn.

Filed Jun. 17, 1982, Ser. No. 383,416
Int. Cl.³ B22F *7/02*
U.S. Cl. 428—552 3 Claims

1. A process for producing a silver material suitable as a backing for silver-cadmium oxide contact materials comprising
(a) forming a relatively uniform admixture consisting essentially of from about 1% by weight to about 15% by weight of silver oxide, from about 10% by weight to about 20% by weight of silver acetate, balance silver powder,
(b) pressing said admixture at a pressure of from about 8,000 psi to about 50,000 psi to form a compacted material having a density of from about 5.0 to about 6.5 grams/cc.
(c) heating said compacted material to increase its tempera-

ture at a rate of from about 10° C./minute to about 25° C./minute to a temperature of about 900° C., and



(d) holding said compacted material at about 900° C. to form a silver material having a density of at a temperature of least about 9.9 grams/cc.

4,450,205

SURFACE-COATED BLADE MEMBER OF SUPER HARD ALLOY FOR CUTTING TOOLS AND PROCESS FOR PRODUCING SAME

Takeshi Itaba; Shotaro Matsumoto, and Takeshi Abe, all of Tokyo, Japan, assignors to Mitsubishi Kinzoku Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 192,628, Sep. 30, 1980, abandoned. This application Jul. 19, 1982, Ser. No. 399,802

Claims priority, application Japan, Oct. 26, 1979, 54-138572

Int. Cl.³ B32B *15/04;* **C23C** *11/08, 13/02, 13/04*

U.S. Cl. 428—552 **6 Claims**

1. In a surface-coated blade member for cutting tools which comprises:

a substrate, and

a coating on at least one surface of said substrate, said coating being composed of (1) a layer of vapor deposited titanium metal on the surface of said substrate, and (2) at least one layer of vapor deposited titanium compound on said layer of titanium metal,

said layer of titanium compound being selected from the group consisting of titanium carbide, titanium nitride, titanium carbo-nitride, titanium oxy-carbide and titanium oxy-carbo-nitride,

said layer of titanium metal being no larger than 2 μm thick and said layer of titanium compound being from 0.5 to 10 μm thick,

the improvement wherein said substrate is a cemented carbide containing 2 to 30% by weight of at least one metal selected from the iron family, and a major proportion of at least one compound selected from the group consisting of carbides, nitrides and carbo-nitrides of metals in Groups IV_A, V_A and VI_A of the Periodic Table

said surface-coated blade member produced by the process comprising the steps of:

(a) placing a cemented carbide substrate in a vacuum chamber;

(b) vapor depositing a layer of titanium metal no larger than 2 μm thick on at least one surface of said substrate; and

(c) subsequently vapor depositing at least one layer of titanium compound on said layer of titanium metal to form a coating on said substrate, said layer of titanium compound being 0.5 to 10 μm thick, and said titanium compound being selected from the group consisting of titanium carbide, titanium nitride, titanium carbo-nitride, titanium oxy-carbide and titanium oxy-carbo-nitride;

provided that during steps (b) and (c) said substrate is maintained at a temperature between about 700° C. to 800° C.

5. In a process for producing a surface-coated blade member for cutting tools, which process comprises the steps of:

(a) placing a substrate in a vacuum chamber;

(b) vapor depositing no larger than 0.9 μm thick layer of titanium metal on at least on surface of said substrate; and

(c) subsequently vapor depositing at least one layer of titanium compound onto said layer of titanium to form a coating on said substrate, said layer of titanium compound being 0.5 to 10 μm thick thereby imparting maximum wear resistance to said coating, and said titanium compound being selected from the group consisting of titanium carbide, titanium nitride, titanium carbo-nitride, titanium oxy-carbide and titanium oxy-carbo-nitride,

the improvement wherein

(1) said substrate is a cemented carbide containing 2 to 30% by weight of at least one metal selected from the iron family, and a major proportion of at least one compound selected from the group consisting of carbides, nitrides and carbo-nitrides of metals in Groups IV_A, V_A and VI_A of the Periodic Table, and wherein

(2) said substrate is maintained at temperatures between about 700° C. and 800° C. during the vapor deposition.

4,450,206

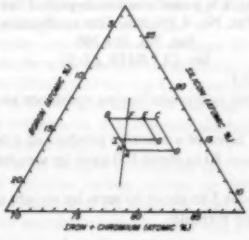
AMORPHOUS METALS AND ARTICLES MADE THEREOF

S. Leslie Ames, Sarver; Thomas H. Gray, Pittsburgh, and Lewis L. Kish, Sarver, all of Pa., assignors to Allegheny Ludlum Steel Corporation, Pittsburgh, Pa.

Filed May 27, 1982, Ser. No. 382,823

Int. Cl.³ B21C *37/00*

U.S. Cl. 428—606 **8 Claims**



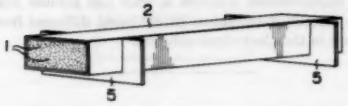
1. An amorphous metal alloy strip article made by rapid solidification of a molten alloy, said article having a thickness of at least 0.001 inch and being suitable for transformers, said alloy consisting essentially of 6–10% boron, 14–17% silicon and 0.5–3.0% chromium, by atomic percentages, no more than incidental impurities, and the balance iron, said article being at least singularly ductile, and said alloy characterized by enhanced castability while maintaining a good combination of magnetic properties of magnetic saturation (B_{75H}) of at least 14 kilogauss, core loss of less than 0.163 watts per pound at 12.6 kilogauss, at 60 Hertz, and coercive force of less than 0.045 oersted.

4,450,207

FIBER REINFORCED METAL TYPE COMPOSITE MATERIAL WITH HIGH PURITY ALUMINUM ALLOY CONTAINING MAGNESIUM AS MATRIX METAL

Tadashi Donomoto; Atsuo Tanaka; Yoshiaki Tatematsu, and Tsugio Akai, all of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Aug. 24, 1983, Ser. No. 525,899
Claims priority, application Japan, Sep. 14, 1982, 57-161397
Int. Cl.³ B22D *19/14*; B21D *37/00*; C22C *21/06*
U.S. Cl. 428—614 6 Claims



1. A fiber reinforced metal type composite material, composed essentially of a mass of reinforcing fibers selected from the group consisting of alumina fibers, carbon fibers, and mixtures thereof, intimately compounded with a matrix metal which is an alloy consisting essentially of between about 0.5% and about 4.5% magnesium, less than about 0.2% each of copper and titanium, less than about 0.5% each of silicon, zinc, iron, and manganese, and remainder aluminum.

4,450,208

COMPOSITE ARTICLE FOR A SEMICONDUCTOR DEVICE

Joseph M. Hunt, Natrona Heights, Pa., assignor to Allegheny Ludlum Steel Corporation, Pittsburgh, Pa.

Filed Sep. 30, 1982, Ser. No. 431,506
Int. Cl.³ H01L *29/00*
U.S. Cl. 428—620 4 Claims

1. A composite article comprising a first layer of metal having an irregular stainless steel metal surface, a second layer consisting essentially of a phosphate, silicate or a combination thereof on said irregular metal surface, said second layer having a thickness sufficient to provide a smooth surface over said irregular metal surface and having a thickness of 0.000001 to 0.0001 inch after curing, and applied by a method selected from the group consisting of reverse roller coating, dipping and spraying, and a third layer of a semiconductor material on said smooth surface.

4,450,209

MULTI-LAYER SURFACE-TREATED STEEL PLATE HAVING ZINC-CONTAINING LAYER

Tomihiro Hara; Masahiro Ogawa, and Masaaki Yamashita, all of Yokohama, Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 7, 1982, Ser. No. 447,523
Claims priority, application Japan, Dec. 8, 1981, 56-196316
Int. Cl.³ C25D *3/22*; E32G *15/08*
U.S. Cl. 428—626 8 Claims

1. A multi-layer surface-treated steel plate consisting essentially of a zinc-containing plating layer, a lithium silicate film layer formed on said plating layer and an organic composite silicate film layer composed of colloidal silica and an organic resin, which is formed on the lithium silicate film layer.

4,450,210

CLAD MATERIAL

Masayuki Takamura, and Kazuo Kurahashi, both of Shizuoka, Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Japan

Filed Oct. 21, 1982, Ser. No. 435,875
Claims priority, application Japan, Oct. 23, 1981, 56-169782
Int. Cl.³ B32B *15/01*
U.S. Cl. 428—660 4 Claims

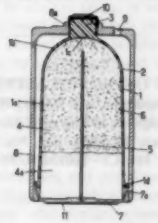
1. An improved clad material comprising
a Ti base metallic core, and
a Ni base metallic covering clad to said Ti base metallic core and including 75 to 98% weight of Ni, 0.5 to 20% by weight of Cu and 0.1 to 5.0 by weight of Cr.

4,450,211

ELECTROCHEMICAL GENERATOR COMPRISING A THIN GAS ELECTRODE

René Vignaud, Aulnay-Sous-Bois, France, assignor to Societe les Piles Wonder, Saint-Quen, France

Filed Apr. 13, 1982, Ser. No. 367,992
Claims priority, application France, Apr. 13, 1981, 81 07409
Int. Cl.³ H01M *12/06*
U.S. Cl. 429—27 5 Claims



1. Electrochemical generator of the metal/air type comprising:
(a) a cylindrical container;
(b) a thin positive air electrode constituting a cathode and being constituted by a slightly truncated conical portion, closed at its smaller diameter end by a substantially hemispherical cap portion, integral with said truncated cone portion, a solid cylindrical nipple crowning the hemispherical cap, said electrode being located inside said container at a certain distance from the internal surface of said container so as to leave a volume of air between said surface and the external surface of said electrode;
(c) an anodic mass located inside said electrode, said mass occupying a substantial portion of the volume inside said electrode;
(d) a first current collector associated with said electrode, said first current collector being constituted by a thin porous metallic film adhering on at least a part of the external surface of said electrode;
(e) a second current collector associated with said anodic mass; and
(f) a separator between said electrode and said anodic mass,

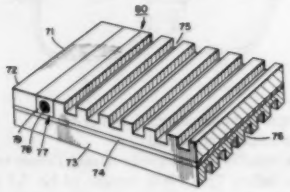
said separator being applied against the internal surface of said electrode.

4,450,212

EDGE SEAL FOR A POROUS GAS DISTRIBUTION PLATE OF A FUEL CELL

Haim Feigenbaum, Highland Park; Sheldon Pudick, Sayreville, and Rajindar Singh, Ridgewood, all of N.J., assignors to Engelhard Corporation, Iselin, N.J.

Filed Sep. 30, 1982, Ser. No. 430,142
Int. Cl.³ H01M *4/88, 8/02*
U.S. Cl. 429—35 **13 Claims**



1. A porous sealed gas distribution plate for a fuel cell comprising:

(a) an impervious layer covering a face of said plate;

(b) a seal adjacent at least one of said plate, said seal comprising:

(c) a groove extending along said edge and through said porous plate to said impervious layer;

(d) a member of resinous material arranged within said groove; and

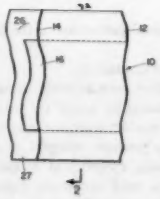
(e) a paste surrounding said member and substantially filling said groove whereby a gas impervious seal is provided which is resistant to deterioration by electrolyte of said cell.

4,450,213

CELL HAVING IMPROVED ABUSE RESISTANCE

Arabinda N. Dey, Needham, and Robert W. Holmes, Arlington, both of Mass., assignors to Duracell Inc., Bethel, Conn.

Filed Jan. 18, 1982, Ser. No. 339,819
Int. Cl.³ H01M *4/36*
U.S. Cl. 429—105 **9 Claims**



1. A method for making a non-aqueous electrochemical cell having improved abuse resistance wherein a cathode, an alkali or alkaline earth metal anode and a fluid non-aqueous electrolyte are placed in operative association within a cell container to make said cell, characterized in that said method comprises the steps of placing and substantially totally enclosing a substantially perforation-free layer of copper within said anode metal prior to placing said anode metal within said cell container and filling said cell container with a fluid non-aqueous electrolyte in which said copper is soluble or ionizable.

9. An abuse resistance cell made in accordance with the method of claims 1,7 or 8.

4,450,214

LITHIUM HALIDE ADDITIVES FOR NONAQUEOUS CELL SYSTEMS

Stephen G. Davis, Rocky River, Ohio, assignor to Union Carbide Corporation, Danbury, Conn.

Filed Jun. 14, 1982, Ser. No. 388,478
Int. Cl.³ H01M *6/14*
U.S. Cl. 429—194 **14 Claims**

1. A nonaqueous cell comprising a lithium anode, a liquid orgaic electrolyte solution compound of a solvent and solute, and an active cathode selected from the group consisting of an iron sulfur-containing cathode and a MnO_2-containing cathode; the improvement wherein at least one lithium halide is added to the cell, said lithium halide being different from the solute used in the electrolyte solution.

4,450,215

COLOR FILTER ELEMENTS COMPRISING HEXAALKOXYMETHYLMELAMINE BARRIER LAYERS

Raymond F. Reithel, and Armin K. Weiss, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 6, 1983, Ser. No. 501,225
Int. Cl.³ G02B *5/22*
U.S. Cl. 430—7 **10 Claims**

1. A color filter element comprising at least two differently colored sets of color arrays and having a barrier layer separating the sets characterized in that the barrier layer is an optically clear polymerized, crosslinked hexaalkoxymethylmelamine monomer.

4,450,216

METHOD FOR IMPROVING THE SENSITOMETRIC RESPONSE OF A PERSISTENTLY CONDUCTIVE PHOTORECEPTOR

George G. Fulmer, Victor, and John R. Lawson, Pittsford, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 22, 1982, Ser. No. 443,786
Int. Cl.³ G03G *13/052, 13/22*
U.S. Cl. 430—31 **12 Claims**

1. A method for improving the sensitometric response of a zinc oxide-free persistently conductive photoreceptor having a period of persistence comprising the steps of:

(a) uniformly charging said photoreceptor to a surface potential, Vo, of a given polarity,

(b) imagewise-exposing said charged photoreceptor to actinic radiation to form a latent electrostatic image thereon and,

(c) during its period of persistence, and prior to development, recharging said photoreceptor to a second surface potential of the same polarity as Vo, thereby producing a developable, modified latent electrostatic image.

4,450,217

CHALCOGENOPENTALENE COMPOUNDS IN ELECTROPHOTOGRAPHY

Michael R. Detty, and Jerome H. Perlstein, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

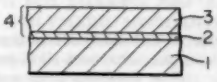
Filed Mar. 15, 1983, Ser. No. 475,675
Int. Cl.³ G03G *5/09, 5/14, 5/06*
U.S. Cl. 430—58 **8 Claims**

1. A multi-active electrophotographic element comprising a conductive support having thereon a charge generation layer containing a chalcogenopentalene having a tellurium or a selenium atom in the 6a position in electrical contact with a charge transport layer containing an electron donor.

4,450,218
PHOTOCONDUCTIVE RECEPTOR FOR AN ELECTROPHOTOGRAPHY

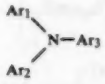
Yoshiaki Takei; Yoshihide Fujimaki, and Hiroyuki Nomori, all of Hachioji, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Sep. 22, 1982, Ser. No. 421,489
Claims priority, application Japan, Oct. 1, 1981, 56-157096
Int. Cl.³ G03G 5/14
U.S. Cl. 430—59 14 Claims



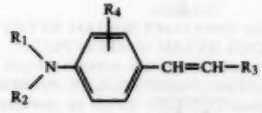
1. In a photoconductive receptor for use in electrophotography, said receptor being provided on a conductive support and having a photoconductive layer, said photoconductive layer comprising a carrier generating layer and a carrier transport layer, said carrier transport layer comprising an amine derivative represented by formula (A) and at least 1% by weight of a styryl compound represented by formula (B), based on the total weight of said amine derivative and said styryl compound;

Formula [A]



wherein, Ar_1 and Ar_2 each represent a phenyl group or a substituted phenyl group, said substituted phenyl group having at least one substituent selected from the group consisting of a halogen atom, an alkyl group, a nitro group and an alkoxy group; and Ar_3 is selected from the group consisting of a phenyl group, a naphthyl group, an anthryl group, a fluorenyl group, and a 5–7 membered heterocyclic ring, wherein said groups and said heterocyclic ring may be substituted with at least one substituent selected from the group consisting of a halogen atom, an alkyl group, a hydroxy group, an alkoxy group, an aryloxy group, a nitro group, a piperidino group, a morpholino group, a naphthyl group, an anthryl group and an amino group, said amino group may be substituted with at least one substituent selected from the group consisting of an acyl group, an alkyl group, an aryl group and an aralkyl group;

Formula [B]

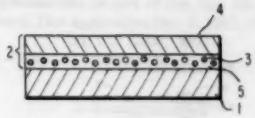


wherein, R_1 and R_2 are each selected from the group consisting of an alkyl group, a substituted alkyl group, a phenyl group and a substituted phenyl group, wherein said substituted alkyl group and said substituted phenyl group have at least one substituent selected from the group consisting of an alkyl group, an alkoxy group and a phenyl group; R_3 is selected from the group consisting of a phenyl group, a naphthyl group, an anthryl group, a fluorenyl group and a carbazolyl group, wherein said R^3 groups may have at least one substituent selected from the group consisting of a halogen atom, a hydroxy group, an alkyl group, an alkoxy group and a phenyl group; and R_4 is selected from the group consisting of a hydrogen atom, a halogen atom, an alkyl group, an alkoxy group, a mono-alkyl amino group and a di-alkyl amino group.

4,450,219
ELECTROPHOTOGRAPHIC PHOTORECEPTOR WITH THIOBARBITURIC ACID DERIVATIVE

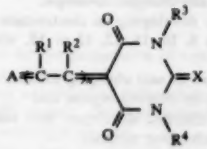
Seiji Horie; Junji Nakano, and Hideo Sato, all of Saitama, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jun. 24, 1982, Ser. No. 391,755
Claims priority, application Japan, Jun. 24, 1981, 56-97996
Int. Cl.³ G03G 5/06
U.S. Cl. 430—59 15 Claims



1. An electrophotographic photoreceptor comprising an electrophotographic photoreceptive layer containing a charge generating material and a charge transporting material, said charge generating material being a compound which has a barbituric acid nucleus or a thiobarbituric acid nucleus represented by the following general formula (I):

(I)



wherein n represents 0, 1 or 2; X represents an oxygen atom or a sulfur atom; R^1 and R^2 independently represent a hydrogen atom, an alkyl group, an aralkyl group or an aryl group; R^3 and R^4 independently represent a hydrogen atom, an alkyl group, an aralkyl group or a phenyl group, wherein the alkyl, aralkyl or phenyl groups may be substituted; and A represents a divalent group derived from a heterocyclic ring selected from a group consisting of imidazoles, 3H-indoles, thiazoles, benzothiazoles, naphthothiazoles, thianaphtheno-7',6',4,5-thiazoles, oxazoles, benzoxazoles, naphthoxazoles, selenazoles, benzoselenazoles, naphthoselenazoles, thiazolines, quinolines, isoquinolines, benzimidazoles and pyridines.

3. The electrophotographic photoreceptor as claimed in claim 1, wherein said electrophotographic photoreceptive layer consists of the combination of a charge generating layer containing the charge generating material and a charge transporting layer containing the charge transporting material.

4,450,220
METHOD OF CHARGING ELECTROSTATIC DEVELOPER

Satoshi Haneda, Hachioji; Takashi Itoh, Tokyo; Ken Nakamura, and Makoto Tomono, both of Hino, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

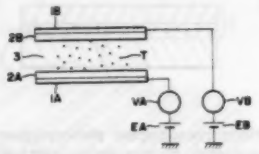
Filed Feb. 18, 1982, Ser. No. 349,999
Claims priority, application Japan, Feb. 25, 1981, 56-25390; Feb. 25, 1981, 56-25391; Feb. 25, 1981, 56-25392; Feb. 25, 1981, 56-25393; Mar. 9, 1981, 56-32417; Mar. 9, 1981, 56-32418; Mar. 9, 1981, 56-32419; Mar. 9, 1981, 56-32420; Mar. 9, 1981, 56-32421; Mar. 9, 1981, 56-32422
Int. Cl.³ G03G 13/08
U.S. Cl. 430—102 39 Claims

9. A method for developing an electrostatic latent image comprising:

providing a developer comprising electrically insulating particles;

providing oppositely disposed charging members defining a charging space therebetween;

providing an electrostatic latent image;
introducing said developer into said charging space which is provided between said charging members,
generating an a.c. field in said charging space having a voltage below the corona discharge level and having a frequency at which said developer can move by applying an a.c. voltage to said charging members,
oscillating and electrically charging said developer by said a.c. field in said charging space between said charging members so that said developer becomes electrically



charged due to friction resulting from developer particles impinging against each other and against said charging members, and developing said electrostatic latent image by said electrically charged developer.

17. A method for developing an electrostatic latent image according to claims 9, 10, 11, 12, 13 or 15, wherein further comprises:
moving at least one of said charging members along a passage reaching a developing region, and
transferring said charged developer into said developing region by said charging member.

4,450,221

ENCAPSULATED LYOPHILIC MAGNETIC PARTICLE AND RESIN TONER

Sadatugu Terada; Satoshi Haneda, both of Hachioji; Makoto Tomono, and Syunji Matsuo, both of Hino, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Jun. 22, 1982, Ser. No. 390,828
Claims priority, application Japan, Jul. 10, 1981, 56-108444
Int. Cl.³ G03G *13/20, 9/14*
U.S. Cl. 430—106.6 **21 Claims**

1. A magnetic toner comprising a nuclear particle which comprises lyophilic magnetic particles and a resin having a low softening point, said particles being encapsulated within a resin wall, wherein said magnetic particles are made lyophilic by treatment with a titanate coupling agent and/or a silane coupling agent.

4,450,222

USE OF CARBON ADSORPTION DEACTIVATING COMPOUNDS IN IMAGE TRANSFER ELEMENTS

Kenneth C. Mattes, Rochester, and Harold C. Warren, Rush, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 20, 1982, Ser. No. 451,586
Int. Cl.³ G03C *1/40, 5/54, 1/84*
U.S. Cl. 430—220 **25 Claims**

1. In a photographic element comprising a support having thereon a dye image-receiving layer, an opaque layer comprising carbon black, and at least one silver halide emulsion layer having associated therewith a dye image-providing material,
the improvement wherein said carbon black has a ballasted deactivating compound adsorbed thereto in such an amount so that said dye image-providing material can diffuse through said opaque layer without any substantial adsorption thereof to said carbon black, said deactivating compound being incapable of releasing any dye moiety therefrom during photographic processing of said element to form a dye image.

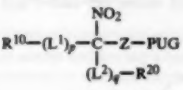
4,450,223

DIFFUSION TRANSFER MATERIAL AND PROCESS

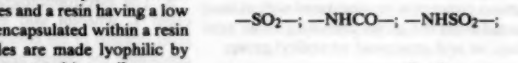
Raphaël K. Van Poucke, Berchem; Christian C. Van de Sande, Belsele, and Andreé Verhecken, Mortsel, all of Belgium, assignors to AGFA-Gevaert, N.V., Mortsel, Belgium

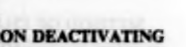
Filed Feb. 14, 1983, Ser. No. 466,316
Claims priority, application United Kingdom, Mar. 16, 1982, 8207583
Int. Cl.³ G03C *1/40, 1/10, 5/54, 1/48*
U.S. Cl. 430—223 **14 Claims**

1. A photographic silver halide material comprising a support carrying at least one unexposed alkali-permeable silver halide hydrophilic colloid emulsion layer and containing a compound, which is immobile in an alkali-permeable colloid medium when contacted with an alkaline liquid and which is capable of being reduced by a silver halide developing agent at a rate slower than that of image-wise developable silver halide in the photographic material and in reduced state is capable of releasing a photographically useful group, characterized in that said compound corresponds to the following general formula:



wherein:
R^{10} and R^{20} (same or different)
(1) represent an alkyl group, a cycloalkyl group, an alkenyl group, a cycloalkenyl group or an aralkyl group,
(2) represent an aryl group, or
(3) represent a heterocyclic ring residue, or
R^{10} and R^{20} are ringclosed, either R^{10} or R^{20} containing a ballasting group conferring diffusion resistance to the compound in hydrophilic colloid media when penetrated by an aqueous alkaline liquid;
L^1 and L^2 (same or different) represent a





group;
p and q (same or different) represent an integer 0 or 1;
Z represents an atom or an atom group which is electronegative with respect to carbon, and
PUG represents together with Z a releasable photographically useful group.

8. A photographic material according to claim 1, characterized in that the material is a film unit that is adapted to be processed by passing said unit between a pair of juxtaposed pressure-applying members, said unit comprising (1) a photosensitive element, which contains a silver halide emulsion layer having associated therewith said compound that is initially immobile in an alkali-permeable colloid medium and where-

from through the reducing action of a silver halide developing agent a dye is split off in diffusible state, (2) an image dye-receiving layer, (3) means for discharging an alkaline processing composition within the film unit, said means being a rupturable container, which is adapted to be positioned during processing of the film so that a compressive force applied to the container by the pressure-applying members will effect a discharge of the container's contents within the film, and (4) a silver halide developing agent, which is soluble in an alkaline processing composition located within said film unit.

4,450,224

POLYMERIC MORDANTS

Gerald W. Klein; Robert A. Snow, both of Pittsford, and Richard C. Sutton, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

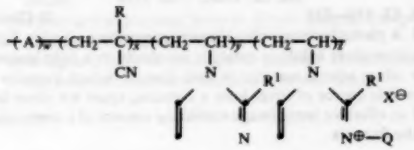
Filed Jul. 6, 1983, Ser. No. 511,129

Int. Cl.³ G03C *1/40, 5/54*; C08F *26/06, 126/06*

U.S. Cl. 430—213 **33 Claims**

1. In a photographic element comprising a support having thereon at least one photosensitive silver halide emulsion layer having associated therewith a dye image-providing material, said support also having thereon a dye image-receiving layer comprising a mordant,

the improvement wherein said mordant is a polymer comprising recurring units having the formula:



wherein

A represents recurring units derived from an α,β-ethylenically unsaturated monomer;

R represents hydrogen or methyl;

each R^1 independently represents hydrogen or an alkyl group of 1 to about 4 carbon atoms;

Q represents an alkyl, substituted alkyl, cycloalkyl, aryl or substituted aryl group;

$X^{\ominus}$ represents an anion;

w is from about 0 to about 25 mole percent;

x is from about 30 to about 90 mole percent;

y is from about 8 to about 65 mole percent;

and

z is from about 2 to about 9 mole percent.

4,450,225

SILVER HALIDE EMULSION PREPARED BY CONVERTING SILVER PHOSPHATE

Edith Weyde, Kuerten; Harald von Rintelen, Leverkusen; Wilhelm Saleck, Bergisch Gladbach, and Heinz-Horst Teitscheid, Leverkusen, all of Fed. Rep. of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen-Bayerwerk, Fed. Rep. of Germany

Continuation of Ser. No. 305,949, Sep. 28, 1981, abandoned. This application Jun. 2, 1982, Ser. No. 499,421

Claims priority, application Fed. Rep. of Germany, Oct. 3, 1980, 3037385

Int. Cl.³ G03C *1/02*

U.S. Cl. 430—567 **11 Claims**

1. A light-sensitive photographic material of improved sensitivity for producing photographic images on imagewise exposure comprising at least one self-supporting or supported light-sensitive silver salt emulsion layer of improved sensitivity containing primarily silver halide wherein the silver halide contained in said silver salt emulsion is obtained by converting inorganic silver phosphate grains with a water-soluble halide.

2. The material as claimed in claim 1 wherein the silver halide grains of the emulsion have an average grain size of at most 0.6 μm.

4,450,226

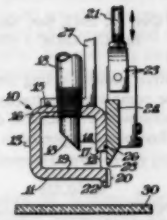
METHOD AND APPARATUS FOR PRODUCING A PRINTING PLATE

William Bloothoofd, Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.

Division of Ser. No. 315,092, Oct. 26, 1981, Pat. No. 4,403,566, which is a continuation-in-part of Ser. No. 161,847, Jun. 23, 1980, abandoned. This application Dec. 8, 1982, Ser. No. 447,741

Int. Cl.³ G03C *5/00*

U.S. Cl. 430—300 **1 Claim**



1. A method for the preparation of a polymerized printing plate comprising the steps of:

(a) providing a horizontal platemaking surface above an actinic light source, which platemaking surface is transparent to such light source;

(b) positioning a negative of the image to be printed on said platemaking surface;

(c) covering said negative with a thin sheet of protective film which is transparent to the actinic light source;

(d) providing a uniform layer of a liquid photopolymerizable resin with an apparatus comprising: said horizontal platemaking surface;

a manifold spanning the width of the platemaking surface vertically nonadjustable with respect to the platemaking surface during movement thereover and moveable along the lengthwise direction of said surface, which manifold is approximately C-shaped in cross-section having a closed bottom side having a wedge shaped lip projecting downward from its forward edge and forming a doctor blade, a back facing side, an upper side, and a forward facing side depending toward but not in contact with the forward edge of said bottom side and defining an opening across the length of said manifold adjacent said bottom side, one of said upper or back facing sides being closed and the other having a plurality of openings for the attachment of resin supply tubes, and closed ends;

a gate being essentially the same length as said manifold, disposed before the opening in the manifold adjacent the bottom side and vertically adjustable so that, when adjusted upward, its lower edge will define with the opening in the manifold an adjustable orifice slot extending the length of the opening in the manifold and when adjusted downwardly completely closing the opening in the manifold;

means to vertically adjust said gate upward and downward;

means to prevent air from entering the apparatus between the gate and the upper section of the forward facing side of the manifold; and

means to supply a regulated flow of liquid photopolymerizable resin material from a pressurized external reservoir through said resin supply tubes attached to said plurality of openings in said manifold;

(e) providing over said layer a sheet of protective film;

(f) exposing the assembly of step (e) to uniform radiation from the actinic light source through the negative to selectively expose and polymerize portions of the photopolymerizable resin layer; and

(g) removing the remaining unexposed photopolymerizable material.

4,450,227

DISPERSED IMAGING SYSTEMS WITH TETRA (HYDROCARBYL) BORATE SALTS

Brian N. Holmes, Oakdale, Minn.; Rex J. Dalzell, Sommerset, Wis., and Steven M. Aasen, Lakeland, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Oct. 25, 1982, Ser. No. 436,264
Int. Cl.³ G03C *1/72*
U.S. Cl. 430—339 **10 Claims**

1. A light-sensitive positive-acting imaging material comprising a first phase comprising a tetra(hydrocarbyl)borate salt in reactive association with a bleachable dye in a solid or liquid medium and said first phase dispersed in a second phase.

4,450,228

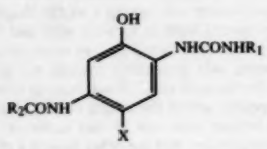
LIGHT-SENSITIVE SILVER HALIDE COLOR PHOTOGRAPHIC MATERIAL

Satoru Shimba; Kenji Ito; Yasuo Tsuda, and Hiroshi Sugita, all of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

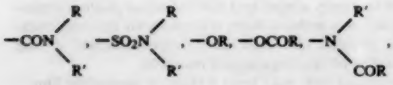
Filed Feb. 22, 1983, Ser. No. 468,400
Claims priority, application Japan, Feb. 25, 1982, 57-30391
Int. Cl.³ G03C *1/46*
U.S. Cl. 430—505 **10 Claims**

1. A light-sensitive silver halide color photographic material, having a blue sensitive silver halide emulsion layer, a green sensitive silver halide emulsion and a red sensitive silver halide emulsion on a support, wherein said red sensitive silver halide emulsion contains at least one compound of formula wherein the amount of silver halide contained in all of the aforesaid light-sensitive silver halide emulsion layers is at least 7.5 g/m² as calculated on silver, and the amount of the silver halide contained in said red sensitive silver halide emulsion is at least 3.5 g/m² as calculated on silver:

Formula [I]



wherein, X represents a hydrogen atom or a group capable of being eliminated by a coupling reaction with an oxidized product of an aromatic primary amine color developing agent; R_1 represents a naphthyl group or a heterocyclic group (provided that a carbon atom of said heterocyclic group is bonded to the ureido group), or a phenyl group having at least one substituent (with the proviso that when one of said substituents is cyano at the p-position of said phenyl group relative to the ureido group, the four ortho and meta positions of said phenyl group relative to the ureido group cannot have hydrogen atoms at the same time) selected from the group consisting of a trifluoromethyl, nitro, cyano, —COR, —COOR, —SO_2R, —SO_2OR,



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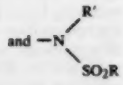


(wherein R represents an aliphatic group or an aromatic group, and R′ is a hydrogen atom, an aliphatic group or an aromatic group); and R_2 represents an aliphatic group or an aromatic group necessary to impart diffusion resistance to the cyan dyes formed from the cyan couplers represented by formula and the cyan dyes to be formed from said cyan coupler.

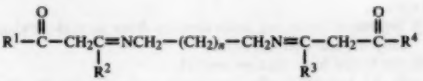
4,450,229

STABILIZATION OF LATENT IMAGES IN PHOTOTHERMOGRAPHIC ELEMENTS

Jack E. Reece, Forest Lake Township, Washington County, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed May 13, 1983, Ser. No. 494,262
Int. Cl.³ G03C *1/02, 1/34*
U.S. Cl. 430—523 **15 Claims**

1. A photothermographic element comprising a binder, light sensitive silver halide in catalytic proximity to a light insensitive silver source material in said element which contains a reducible source of silver ions, a reducing agent for silver ion and an effective latent image stabilizing amount of a compound of the formula



wherein

R^1 and R^4 are independently selected from hydrogen and alkyl groups of 1 to 4 carbon atoms,

R^2 and R^3 are independently selected from hydrogen and alkyl groups of 1 to 4 carbon atoms, and

n is zero or a positive whole integer between 1 and 4.

4,450,230

PHOTOGRAPHIC ELEMENTS WITH IMPROVED SURFACE CHARACTERISTICS

Gerolamo Delfino, Savona, and Simone Franco, Ferrania/-Savona, both of Italy, assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Oct. 18, 1982, Ser. No. 434,969
Claims priority, application Italy, Oct. 23, 1981, 49559 A/81
Int. Cl.³ G03C *1/78*
U.S. Cl. 430—539 **19 Claims**

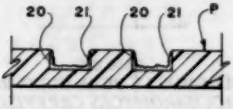
1. Photographic element comprising a support and a plurality of gelatin layers which comprise at least a silver halide emulsion layer and an external gelatin protective layer, characterized in that said external protective layer comprises, in a proportion of 10 to 60% by weight of the gelatin in said protective layer, a water-soluble vinyl polymer containing methylolamide moieties as pendant groups on 50 to 100 weight percent of ethylenic groups in said vinyl polymer in a quantity sufficient to reduce brightness.

4,450,231

IMMUNOASSAY FOR DETERMINATION OF IMMUNE COMPLEXES WITH POLYMER-COATED PLASTIC BASE

Adil N. Ozkan, Denver, Colo., assignor to Biostar Medical Products, Inc., Boulder, Colo.

Filed Mar. 31, 1982, Ser. No. 363,967
Int. Cl.³ G01N *33/54*
U.S. Cl. 435—7 16 Claims



1. In a method of performing an immunoassay of a fluid specimen to determine immune complexes therein, the steps comprising:

treating a solid phase, plastic base having means for receiving the fluid specimen to be assayed, to produce a layer of a non-proteinaceous non-ionic polymer on said means, said polymer adhering to said plastic base and having the capability of absorbing immune complexes which may be present in such specimen;

placing the fluid specimen to be assayed on said receiving means;

permitting said polymer layer to absorb immune complexes present in said specimen; and

treating said layer in a manner to produce an indication of the amount of immune complexes in said layer.

4,450,232

INCORPORATION OF PYRIDOXAL PHOSPHATE IN DRY ANALYTICAL ELEMENTS FOR THE DETERMINATION OF ENZYMES

Karl J. Sanford; John W. Sutherland, and Jon N. Eikenberry, all of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 4, 1982, Ser. No. 345,844
Int. Cl.³ C12Q *1/00, 1/26, 1/52, 1/48*
U.S. Cl. 435—15 9 Claims

1. A dry analytical element for the determination of an analyte in a liquid sample wherein said analyte is an enzyme activated by pyridoxal phosphate, said element comprising a support having thereon a layer comprising a reagent composition capable of producing a detectable change in response to the presence of the activated form of said enzyme

wherein said element contains a layer comprising pyridoxal phosphate at a coverage such that the multiplication product of said coverage and the spreading coefficient of the element results in a substantially uniform reaction mixture concentration of pyridoxal phosphate of greater than about 0.9 mmole per liter.

8. A method for activating an enzyme in a liquid sample with pyridoxal phosphate, said method comprising the step of contacting said sample with a dry element comprising a support having thereon at least one layer comprising pyridoxal phosphate at a coverage such that the multiplication product of said coverage and the spreading coefficient of the element results in a substantially uniform reaction mixture concentration of pyridoxal phosphate is greater than about 0.9 mmole per liter.

4,450,233

IMMOBILIZATION OF MICROORGANISMS IN A POLYMER GEL

Akio Mimura; Katsumi Yuasa, and Mitsuru Shibukawa, all of Shizuoka, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Dec. 15, 1981, Ser. No. 330,916
Claims priority, application Japan, Dec. 23, 1980, 55-181383
Int. Cl.³ C12N *11/10, 11/08, 11/04*
U.S. Cl. 435—178 6 Claims

3. A polymer gel containing immobilized microorganisms made by a process comprising adding microorganism cells to an aqueous solution of a mixture of a polymerizable starch and a polymerizable vinyl monomer, said polymerizable starch being prepared by introducing an acrylamidomethyl group into starch and said polymerizable starch being present in an amount of about 5 to 80 weight percent based on the total weight of the polymerizable starch and the polymerizable monomer, and, thereafter, polymerizing the mixture to prepare a polymer gel with microorganism cells enclosed therein.

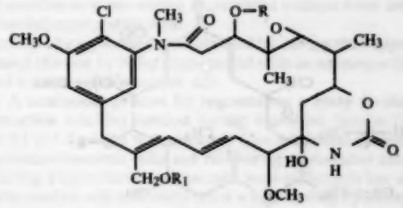
4,450,234

ANTIBIOTIC C-15003 PHM AND PRODUCTION THEREOF

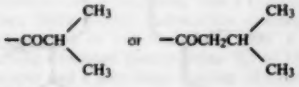
Toru Hasegawa, Kawanishi, Motowo Izawa, Amagasaki, and Seiichi Tanida, 2-chome, Nagaokakyo, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Division of Ser. No. 188,242, Sep. 17, 1980, Pat. No. 4,331,598.
This application Feb. 10, 1982, Ser. No. 347,724
Claims priority, application Japan, Sep. 19, 1979, 54-121234
Int. Cl.³ C12N *1/20;* C12R *1/365*
U.S. Cl. 435—253 1 Claim

1. A biologically pure culture of *Nocardia* sp. No. N-1231, ATCC 31565, which is capable of producing antibiotic C-15003 PHM of the structural formual.



wherein R is —$COCH_3$, —$COCH_2CH_2$,



and R_1 is hydrogen.

4,450,235

ASPOROGENIC MUTANT OF BACILLUS SUBTILIS USEFUL AS A HOST IN A HOST-VECTOR SYSTEM

Donald H. Dean, Worthington, and Daniel M. Ellis, Columbus, both of Ohio, assignors to CPC International Inc., Englewood Cliffs, N.J.

Filed Apr. 21, 1982, Ser. No. 370,432
Int. Cl.³ C12N *1/20, 15/00;* C12R *1/25*
U.S. Cl. 435—253 2 Claims

1. A biologically pure culture of asporogenous *B. subtilis* DE100 (ATCC 39,094) suitable for use as a host component in a host-vector system characterized in that it has a frequency of reversion to spore formers of less than about 10^{-7} when grown

under conditions of aeration and having the following genetic markers: thy A1, thy B1, trp C2, pyr D1, and spo OAΔ677.

4,450,236

ASPOROGENIC MUTANT OF *BACILLUS SUBTILIS* USEFUL AS A HOST IN A HOST-VECTOR SYSTEM

Donald H. Dean, Worthington, and Daniel M. Ellis, Columbus, both of Ohio, assignors to CPC International Inc., Englewood Cliffs, N.J.

Filed Apr. 21, 1982, Ser. No. 370,239

Int. Cl.³ C12N *1/20, 15/00*; C12R *1/25*

U.S. Cl. 435—253 **2 Claims**

1. A biologically pure culture of asporogenous *B. subtilis* DE101 (ATCC 39,095) suitable for use as a host component in a host-vector system characterized in that it has a frequency of reversion to spore formers of less than about 10^{-7} when grown under conditions of aeration and having the following genetic markers: thy A1, thy B1, pyr D1, and spo OAΔ677.

4,450,237

***STREPTOMYCES ALBUS* SUBSPECIES INDICUS**

Walter D. Celmer, New London; Walter P. Cullen, East Lyme, both of Conn.; Riichiro Shibakawa, Handa, and Junsuke Tone, Chita, both of Japan, assignors to Pfizer Inc., New York, N.Y.

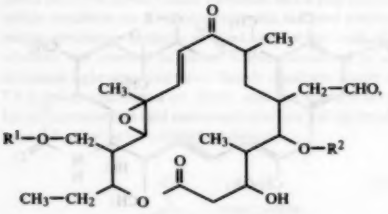
Division of Ser. No. 374,223, May 3, 1982, Pat. No. 4,411,892.

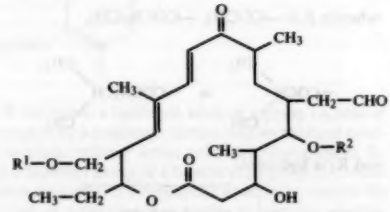
This application Sep. 6, 1983, Ser. No. 529,802

Int. Cl.³ C12N *1/20*; C12P *19/62*; C12R *1/47*

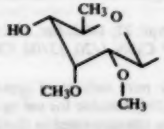
U.S. Cl. 435—253 **1 Claim**

1. A biologically pure culture of the microorganism *Streptomyces albus* subsp. indicus, ATCC 39012, said culture being capable of producing, in a recoverable quantity, upon cultivation in an aqueous nutrient medium containing assimilable sources of nitrogen and carbon, a compound selected from the group consisting of

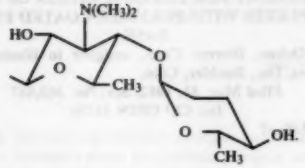




and the pharmaceutically-acceptable acid addition salts thereof; wherein R^1 is the group of the formula



and R^2 is the group of the formula



4,450,238

BIOLOGICALLY PURE CULTURE OF *SACCHAROMYCES CEREVISIAE*

Vincenza Vitobello; Paolo Branduzzi, and Nadia Cimini, all of Rome, Italy, assignors to E. N. I. Ente Nazionale Idrocarburi, Rome, Italy

Division of Ser. No. 213,657, Dec. 5, 1980, Pat. No. 4,376,167.

This application Nov. 5, 1982, Ser. No. 439,378

Claims priority, application Italy, Feb. 1, 1980, 19618 A/80

Int. Cl.³ C12N *1/18, 9/40*; C13J *1/00*; C12R *1/865*

U.S. Cl. 435—256 **2 Claims**

1. A biologically pure culture of a strain of *Sacharomyces cerevisiae*, NRRL-Y-12056, said culture being capable of producing alpha-galactosidase in culture medium devoid of galactose.

4,450,239

METHOD OF DETERMINING PREGNANEDIOL IN FEMALE URINE AND TEST DEVICE FOR USE THEREIN

Robert T. Chatterton, River Forest, Ill., assignor to Northwestern University, Evanston, Ill.

Filed Sep. 23, 1981, Ser. No. 304,803

Int. Cl.³ G01N *33/52, 33/54, 33/58, 21/00*

U.S. Cl. 436—510 **13 Claims**

1. The method of determining the concentration of pregnanediol glucuronide (PG) in a female, comprising:

(a) adding to a measured sample of said urine a predetermined quantity of antibodies binding to PG, said antibodies being labeled with a substance capable of providing a visual color indication;

(b) contacting the reacted urine sample with a predetermined quantity of a 20-α reagent immobilized on a color indicator support, said reagent consisting essentially of 20α-hydroxy-4-pregnen-3-one, the unreacted labeled antibodies from said urine binding to said 20-α reagent on said support; and

(c) determining from the intensity of color developed the concentration of PG in the urine sample.

4,450,240

CERAMIC COMPOSITIONS HAVING HIGH DIELECTRIC CONSTANT AND HIGH SPECIFIC RESISTIVITY

Haruhiko Miyamoto, and Masatomo Yonezawa, both of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Mar. 15, 1983, Ser. No. 475,538

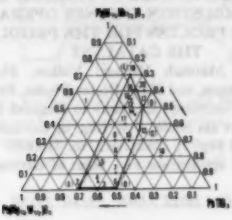
Claims priority, application Japan, Mar. 17, 1982, 57-42167; Apr. 8, 1982, 57-58563; Apr. 8, 1982, 57-58564; Apr. 8, 1982, 57-58565; Apr. 8, 1982, 57-58566

Int. Cl.³ C04B *35/00, 35/46*

U.S. Cl. 501—136 **6 Claims**

1. A ceramic composition consisting essentially of lead magnesium tungstate $[Pb(Mg_{\frac{1}{2}}W_{\frac{1}{2}})O_3]$, lead titanate $[PbTiO_3]$ and lead nickel niobate $[Pb(Ni_{\frac{1}{2}}Nb_{\frac{1}{2}})O_3]$ wherein the composition is expressed by $[Pb(Mg_{\frac{1}{2}}W_{\frac{1}{2}})O_3]_x[PbTiO_3]_y[Pb(Ni_{\frac{1}{2}}Nb_{\frac{1}{2}})O_3]_z$ where $x+y+z+1.00$, said composition lies on lines intercon-

necting five points (x=0.693, y=0.297, z=0.01) (x=0.495, y=0.495, z=0.01), (x=0.195, y=0.455, z=0.35), (x=0.10, y=0.40, z=0.50) and (x=0.06, y=0.24, z=0.70) and in a region bounded by said lines.



4,450,241

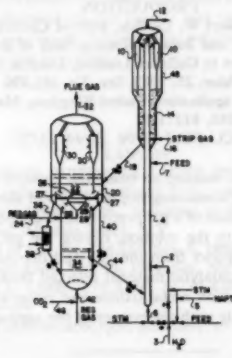
ENDOTHERMIC REMOVAL OF COKE DEPOSITED ON CATALYTIC MATERIALS DURING CARBO-METALLIC OIL CONVERSION

William P. Hettinger, Jr., Russell; Stephen M. Kovach, Ashland, both of Ky., and James F. Hoffman, Huntington, W. Va., assignors to Ashland Oil, Inc., Ashland, Ky.

Division of Ser. No. 290,277, Aug. 5, 1981. This application Aug. 16, 1982, Ser. No. 418,880

Int. Cl.[3] B01J *29/38, 21/20;* C10G *11/05, 11/04*

U.S. Cl. 502—34 14 Claims



1. In a process for regenerating a finely divided hydrocarbon cracking catalyst having deposited thereon a substantial quantity of hydrocarbonaceous coke by contacting said catalyst at an elevated temperature with a gas rich in carbon dioxide to endothermically convert said hydrocarbonaceous coke substantially to carbon monoxide and water; the improvement which consists essentially of:

(a) heating said catalyst to a temperature in a range from about 1350° F. to about 1600° F.,

(b) contacting said catalyst with said carbon dioxide rich gas for a time sufficient to endothermically convert a substantial portion of said hydrocarbonaceous coke to carbon monoxide and water while maintaining said catalyst at a temperature in the range of about 1250° F. to about 1600° F. throughout said contacting period, and

(c) recovering said catalyst from step (b);

said catalyst being further characterized by having about 0.2 to 5.0 weight % copper deposited thereon by being impregnated with an aqueous solution of a water soluble copper salt.

4. A process of claim 1 in which titanium also is deposited on the cracking catalyst.

5. A continuous process for regenerating a finely divided hydrocarbon cracking catalyst having deposited thereon (1) about 0.2 to 5.0 weight % of copper, and (2) a substantial quantity of hydrocarbonaceous coke and recovering regenerated catalyst having a hydrocarbonaceous coke level sufficiently low so that the catalyst will efficiently crack a high-boiling hydrocarbon feed stock having a Conradson carbon content of at least about 6 weight % and less than 200 ppm of metals consisting of Ni, V, Fe, and Cu, said process consisting essentially of:

(a) continuously introducing into a first catalyst regeneration zone finely divided hydrocarbon cracking catalyst having deposited thereon about 0.2 to 5.0 weight % of copper and a substantial quantity of hydrocarbonaceous coke, said catalyst having an introduction temperature of less than about 1100° F.,

(b) contacting the catalyst in the first regeneration zone with an oxygen containing gas to partially burn the hydrocarbonaceous coke thereon,

(c) maintaining the oxygen concentration and the catalyst contact time in the first regenerating zone so that the catalyst temperature is elevated to and maintained within a range of from about 1250° F. to about 1600° F.,

(d) continuously transferring catalyst from said first regeneration zone to a second regeneration zone,

(e) contacting the catalyst in the second regeneration zone with a carbon dioxide rich gas to convert the remainder of the hydrocarbonaceous coke on the catalyst substantially to carbon monoxide and water,

(f) maintaining the carbon dioxide concentration and the contact time in the second regeneration zone so that the catalyst temperature therein is maintained within a range of from about 1250° F. to about 1600° F. and the hydrocarbonaceous coke on the catalyst is reduced to a level sufficiently low so that the regenerated catalyst will efficiently crack a high-boiling hydrocarbon feed stock having a Conradson carbon content of at least about 6 weight % and less than 200 ppm of metals consisting of Ni, V, Fe, and Cu, and

(g) continuously recovering regenerated catalyst from said second regenerating zone;

said catalyst being further characterized by having the copper deposited thereon by being impregnated with an aqueous solution of a water soluble copper salt.

10. A continuous process for regenerating a finely divided hydrocarbon cracking catalyst having deposited thereon (1) about 0.2 to 5.0 weight % copper, and (2) a substantial quantity of hydrocarbonaceous coke and recovering regenerated catalyst having a hydrocarbonaceous coke level sufficiently low so that the catalyst will efficiently crack a high-boiling hydrocarbon feed stock having a Conradson carbon content of at least about 6 weight % and less than 200 ppm of metals consisting of Ni, V, Fe, and Cu, said process consisting essentially of:

(a) continuously withdrawing from a hydrocarbon cracking zone finely divided hydrocarbon cracking catalyst at a temperature of less than about 1100° F., said catalyst having deposited thereon about 0.2 to 5.0 weight % of copper and a substantial quantity of hydrocarbonaceous coke,

(b) heating the catalyst withdrawn in step (a) to a temperature in a range from about 1250° F. to about 1600° F.,

(c) continuously transferring the heated catalyst from step (b) to a first regeneration zone,

(d) contacting the catalyst in the first regeneration zone with a carbon dioxide-rich gas to convert a substantial portion of the hydrocarbonaceous coke on the catalyst substantially to carbon monoxide and water while maintaining the carbon dioxide concentration at a level such that the catalyst is maintained at a temperature in the range of from about 1250° F. to about 1600° F.,

(e) continuously transferring catalyst from said first regeneration zone to a second regeneration zone,

(f) contacting the catalyst in the second regeneration zone with an oxygen containing gas to burn substantially the remainder of the hydrocarbonaceous coke on the catalyst,

(g) maintaining the oxygen concentration and the contact time in the second regeneration zone so that the catalyst temperature therein is maintained within a range of from about 1250° F. to about 1600° F. and the hydrocarbonaceous coke on the catalyst is reduced to a level sufficiently low so that the regenerated catalyst will efficiently crack a high-boiling hydrocarbon feed stock having a Conradson carbon content of at least about 6 weight % and less than 200 ppm of metals consisting of Mi, V, Fe, and Cu, and

(h) continuously recovering regenerated catalyst from said second regenerating zone;

said catalyst being further characterized by having the copper deposited thereon by being impregnated with an aqueous solution of a water soluble copper salt.

4,450,242

CATALYST FOR POLYMERIZING OLEFINS

Robert I. Mink, Yonkers, N.Y., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Aug. 9, 1982, Ser. No. 405,977
Int. Cl.³ C08F 4/64
U.S. Cl. 502—105 45 Claims

29. A process for producing a component containing titanium halide of a catalytic system for polymerizing olefins comprising:

(i) copulverizing a substantially anhydrous magnexium compound containing halogen or manganese compound containing halogen with: a phenol, an organic polymer containing silicon, a titanium halide, and an electron-donor compound to produce a copulverized product, and

(ii) reacting the copulverized product with a liquid titanium compound containing halogen.

4,450,243

CARRIER FOR OLEFIN POLYMERIZATION CATALYST

Kazuo Matsuura, Ota; Nobuyuki Kuroda, Yokohama; Takeichi Shiraishi, Kawasaki; Yutaka Shikatani, Yokohama, and Mituji Miyoshi, Fujisawa, all of Japan, assignors to Nippon Oil Company, Limited, Tokyo, Japan

Filed Feb. 2, 1983, Ser. No. 463,078
Claims priority, application Japan, Feb. 12, 1982, 57-19801
Int. Cl.³ C08F 4/64, 4/68
U.S. Cl. 502—131 8 Claims

1. A carrier for an olefin polymerization catalyst, said carrier comprising a substance obtained by adding a liquid organic compound not dissolving a magnesium halide into a liquid medium having dissolved therein a substance which contains the magnesium halide as at least one component, said liquid medium further containing an oxide of Group II–IV metal or metals in the Periodic Table, followed by coolihg to a temperature not higher than 0° C. and subsequent heat treatment at a temperature in the range of 40° to 200° C.

7. An olefin polymerization catalyst comprising the combination of a titanium compound and/or a vanadium compound supported on the carrier of claim 1 and an organometallic compound.

4,450,244

CATALYST FOR THE COMBUSTION OF HARMFUL SUBSTANCES CONTAINED IN EXHAUST GASES OF INTERNAL COMBUSTION ENGINES OPERATED WITH ALCOHOL AND PROCESS FOR THE PRODUCTION OF THE CATALYST

Rainer Domesle, Maintal; Herbert Völker, Hanau; Edgar Koberstein, Alzenau, and Hans-Dieter Pletka, Freigericht, all of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Sep. 7, 1982, Ser. No. 415,635
Claims priority, application Fed. Rep. of Germany, Sep. 18, 1981, 3137169
Int. Cl.³ B01J 21/04, 23/10, 23/58
U.S. Cl. 502—185 16 Claims

1. A catalyst for the combustion of harmful substances contained in exhaust gases of internal combustion engines operated with alcohol, comprising a matrix having continuous channels along a main axis, said matrix being made of smooth and corrugated layers of high temperature resistant and scale resistant steel or a steel having a correspondingly resistant surface, which layers are disposed in alternate arrangement, said layer having a coating thereon comprising an aluminum oxide of the transition series and an amount of palladium of about 0.03–3% by weight, in relation to the total weight of coating and palladium, being deposited on said coating.

4,450,245

SUPPORTED CATALYSTS AND METHOD FOR THEIR PRODUCTION

Noel J. Adair; Robert W. Carlisle, both of Carrickfergus; Michael E. Stubbs, and John J. Rooney, both of Belfast, all of Ireland, assignors to Gallaher Limited, London, England

Filed Mar. 25, 1982, Ser. No. 361,880
Claims priority, application United Kingdom, Mar. 26, 1981, 8109574; Jun. 4, 1981, 8117198
Int. Cl.³ B01J 21/04, 23/44, 23/72
U.S. Cl. 502—211 11 Claims

1. A method of making an oxidation catalyst comprising forming a solution containing copper ions and aluminum ions and causing formation of a gel precipitate of copper aluminate by adding a base to the solution, drying the gel, forming a shaped catalyst support from the gel, and depositing on the shaped support a catalytic material selected from the group consisting of transition metal oxides and materials that will form a redox couple with the copper of the support.

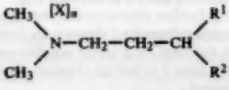
4,450,246

NOVEL POLYURETHANE CATALYSTS IN POLYURETHANE FOAM PROCESS

Felek Jachimowicz, Columbia, Md., assignor to W. R. Grace & Co., New York, N.Y.

Filed Oct. 26, 1982, Ser. No. 436,814
Int. Cl.³ C08G 18/14, 18/18
U.S. Cl. 521—129 19 Claims

1. A process for forming a polyurethane comprising reacting an organic polyisocyanate with a polyol selected from an organic polyether polyol or polyester polyol in the presence of a catalytic amount of an amine selected from the group having the structural formula:



or

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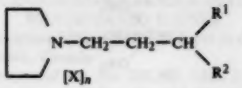


wherein R^1 is a methyl or ethyl group and R^2 is a hydrogen or methyl group such that when R^1 is methyl, R^2 is methyl and when R^1 is ethyl, R^2 is hydrogen, X is an organic mono or dicarboxylic acid and n is a number from 0 to up to 1.

4,450,247

AIR DRYING COATINGS HAVING LONG TERM WATER REPELLENCY

William B. Crockatt, Mississauga, and John Rimma, Scarborough, both of Canada, assignors to DeSoto, Inc., Des Plaines, Ill.

Filed Apr. 14, 1982, Ser. No. 368,136
Int. Cl.³ C08L *91/08*
U.S. Cl. 523—518 **9 Claims**

1. An air drying coating adapted to deposit coatings possessing long term water repellency comprising, a solution of high viscosity unsaturated hydroxy functional oil-modified alkyd resin in mineral spirits, and from 13–63 parts by weight of dissolved paraffin wax having an average melting point in the range of 50° C. to 70° C. per 100 parts of said alkyd resin, said wax being incorporated by adding granules of said wax having an average diameter of less than 1 mm to said alkyd resin solution and vigorously agitating the mixture to increase the temperature to at least about 35° C.

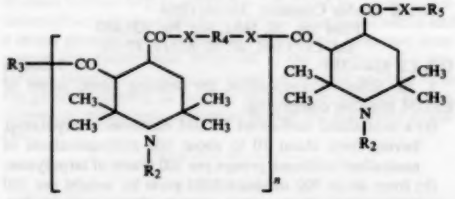
4,450,248

HINDERED PIPERIDYL LIGHT STABILIZERS

William E. Leistner, Atlantic Beach, N.Y., and Charles G. Overberger, Ann Arbor, Mich., assignors to Phoenix Chemical Corporation, Atlantic Beach, N.Y.

Continuation of Ser. No. 184,637, Sep. 8, 1980, abandoned. This application Aug. 14, 1981, Ser. No. 293,048
Int. Cl.³ C08K *5/39*; C08F *12/30*; C07D *401/00*
U.S. Cl. 524—99 **18 Claims**

1. A piperidine-4-carboxylic acid derivative of the formula



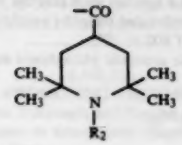
wherein:

R_2 is hydrogen, alkyl having from one to four carbon atoms, or oxyl;

R_3 is $—XR_5$ or —CN;

R_4 is alkylene having from two to twelve carbon atoms; cycloalkylene having from three to twelve carbon atoms; arylene having from six to twelve carbon atoms; or aralkylene having from seven to twelve carbon atoms;

R_5 is hydrogen, alkyl having from one to twenty carbon atoms, cycloalkyl having from five to six carbon atoms; or alkenyl having from three to twenty carbon atoms; or



X is —O— or —NH—; and

n is 0 to 10;

and the acid addition salts thereof.

4,450,249

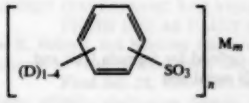
INTERNAL ANTISTATIC AGENTS FOR POLYCARBONATES AND FOR POLYCARBONATE FILMS

Manfred Schmidt, Krefeld; Joachim Wank, Dormagen-Hons; Eckart Reese, Dormagen; Dieter Freitag, Krefeld-Traar; Klaus Wangermann, Krefeld, and Wolfgang Cohnen, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 172,048, Jul. 25, 1980, abandoned. This application Aug. 19, 1982, Ser. No. 409,463
Claims priority, application Fed. Rep. of Germany, Aug. 1, 1979, 2931172
Int. Cl.³ C08K *5/42*
U.S. Cl. 524—132 **8 Claims**

1. A polycarbonate composition characterized by its antistatic properties consisting of a polycarbonate resin and a member selected from a group consisting of alkali metal salts or alkaline earth metal salts of

(i) the monomeric aromatic sulfonic acid of the general formula (I)



in which

D denotes C_4–C_{20}-alkyl or alkenyl, and

M denotes Li and

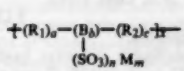
m=n=1, or

M denotes Ca and

m=1 and

n=2,

(ii) the polymeric aromatic (poly)-sulfonic acid of the general formula (II)

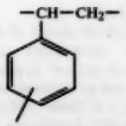


(II)

wherein

R_1 and R_2 independently denote a C_2–C_6-alkylene radical,

B denotes

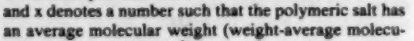


M denotes an alkali metal and m=n=1 or

M denotes an alkaline earth metal in which case M=1 and n=2; a, b and c denote integers equal to or greater than

1 with the proviso that b=3 to 30 and a+b+c=100 and x denotes a number such that the polymeric salt has an average molecular weight (weight-average molecular weight) of 800 to 10^6;

(iii) the monomeric aromatic phosphonic acid of the general formula (III)



(III)

wherein

A denotes an aryl radical containing 1–4 aromatic rings,

R_1 denotes C_4–C_{20}-alkyl, alkenyl, C_6–C_{20}-cycloalkyl or cycloalkenyl,

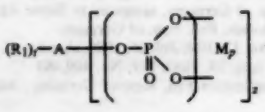
t is an integer of from 1–4,

M denotes an alkali metal and

p=2, or

M denotes an alkaline earth metal, in which case, p=1 and z denotes 1 or 2;

(iv) the monomeric partial aromatic phosphoric acid ester of the general formula (IV)

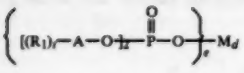


(IV)

wherein

A, R_1, t, M, p and z are as defined for formula (III);

(V) the monomeric partial aromatic phosphoric acid ester of the general formula (V)



(V)

wherein

A, R_1 and t are as defined for formula (III) and

M denotes an alkali metal and

d=e=1 or

M denotes an alkaline earth metal, in which case, d=1 and e=2.

4,450,250

POLYESTER ADHESIVES

Richard L. McConnell; Max F. Meyer, Jr., and Frederick D. Petke, all of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 28, 1983, Ser. No. 479,609

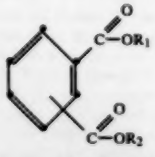
Int. Cl.³ C08K *5/12, 5/52;* **C08L** *67/02*

U.S. Cl. 524—141 **5 Claims**

1. Adhesive composition comprising:

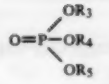
(a) an amorphous or a crystallizable polyester having a melting point of about 80° C. to about 230° C. and a heat of fusion of 0 to about 18 calories per gram, and

(b) from about 1 to about 35% by weight of a compound selected from the group consisting of



(I)

wherein R_1 is benzyl or phenyl and R_2 is benzyl, phenyl or an alkyl group containing 1 to 10 carbon atoms, and



(2)

wherein R_3 is phenyl or benzyl, R_4 is phenyl or benzyl and R_5 is an alkyl group containing 1 to 10 carbon atoms.

4,450,251

THERMOSETTING AQUEOUS VARNISH COMPOSITIONS

Edwin A. Zychowski, Des Plaines, and Ronald L. Richards, Oak Park, both of Ill., assignors to DeSoto, Inc., Des Plaines, Ill.

Filed Mar. 9, 1983, Ser. No. 473,546

Int. Cl.³ C08K *5/18*

U.S. Cl. 524—251 **8 Claims**

1. An aqueous thermosetting coating composition comprising a substantially stable dispersion including

(A) about 20 to about 40 weight percent of a solution copolymer polymerized from monomers consisting essentially of (a) about 50 to about 75 weight percent vinyl acetate, (b) about 10 to about 45 weight percent of C_1–C_8 alkyl acrylate or methacrylate ester and (c) about 5 to about 15 weight percent of a mixture of (i) at least about 0.5 weight percent monoethylenically unsaturated C_3–C_5 carboxylic acid and (ii) at least about 2 weight percent C_2–C_4 hydroxyalkyl acrylate or methacrylate, wherein said copolymer has a calculated T_g value of about −10° to about +15° C. and is polymerized at a temperature of at least about 110° C. at a non-volatile solids content of about 65 to about 80 percent;

(B) about 35 to about 55 weight percent water;

(C) about 7 to about 15 weight percent water-miscible organic solvent;

(D) about 7 to about 15 weight percent cross-linking agent; and

(E) an amount of volatile amine sufficient to disperse said copolymer in said water and said water-miscible organic solvent.

4,450,252

CONTACT ADHESIVE AND ADHESIVE SYSTEM FOR EPDM AND RELATED ELASTOMERS

John W. Fieldhouse, Mogadore, Ohio, assignor to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Sep. 30, 1982, Ser. No. 431,403

Int. Cl.³ C08L *61/10, 61/14, 47/00*

U.S. Cl. 524—353 **7 Claims**

1. An adhesive composition for bonding cured layers of EPDM together comprising:

(a) a neutralized surfonated EPDM elastomeric terpolymer having from about 10 to about 100 milliequivalents of neutralized sulfonate groups per 100 grams of terpolymer;

(b) from about 500 to about 1700 parts by weight per 100 parts by weight of said terpolymer of an organic hydrocarbon solvent or mixture of an organic hydrocarbon solvent and an aliphatic alcohol;

(c) from about 25 to about 100 parts by weight per 100 parts by weight of said terpolymer of a para-alkylated phenol formaldehyde or an N-methylol morpholine-modified para-alkylated phenol formaldehyde tackifying resin; and

(d) from about 12.5 to about 75 parts by weight per 100 parts by weight of said terpolymer of an alkylphenol or ethoxylated alkylphenol.

7. The composition of claim 1 wherein said alkylphenol is p-nonylphenol or p-dodecylphenol.

4,450,253

PROPELLANT-ACTIVE CARRIER SYSTEM FOR WATER-BASED PAINTS

Albert Suk, Richmond Hill, Canada, assignor to CCL Industries Inc., Willowdale, Canada

Continuation-in-part of Ser. No. 237,189, Mar. 3, 1981, which is a continuation-in-part of Ser. No. 192,454, Sep. 30, 1980, abandoned, which is a continuation-in-part of Ser. No. 97,152, Nov. 23, 1979, Pat. No. 4,265,797, which is a continuation-in-part of Ser. No. 968,277, Dec. 11, 1978, abandoned. This application Nov. 12, 1982, Ser. No. 441,278

Int. Cl.³ C08K *5/06*

U.S. Cl. 524—378 15 Claims

1. An aerosol water-based paint composition suitable for spray, application to a substrate surface and air drying to a continuous durable film thereon, comprising:

(a) about 6 to about 25 wt. % of at least one film-forming polymer which is a drying oil-modified ester polymer which is rendered water soluble by neutralization with a volatile base and which is capable of air drying to a water-resistant coating film upon volatilization of said volatile base after spraying the polymer onto a substrate surface,

(b) about 20 to about 60 wt. % of dimethyl ether,

(c) about 20 to about 40 wt. % of water,

(d) about 0.1 to about 30 wt. % of at least one water-soluble polar organic solvent,

(e) 0 to about 3 wt. % of at least one surfactant,

(f) 0 to about 15 wt. % of at least one pigment,

(g) 0 to about 1 wt. % of at least one pH stabilizer,

(h) 0 to about 2 wt. % of at least one antifoam agent,

(i) 0 to about 2 wt. % of at least one plasticizer, and

(j) 0 to about 0.5 wt. % of at least one drier for said film-forming polymer,

said dimethyl ether, water, and at least one polar organic solvent being present in proportions to provide a single liquid phase propellant-active carrier solution having a pH of about 7.2 to about 10 and in which said film-forming polymer is dissolved and the remainder of the components of the composition are dissolved or suspended.

4,450,254

IMPACT IMPROVEMENT OF HIGH NITRILE RESINS

Ralph E. Isley, Northfield; Dorothy C. Prem, Sagamore Hills, and June T. Duke, Chagrin Falls, all of Ohio, assignors to Standard Oil Company, Cleveland, Ohio

Continuation of Ser. No. 203.022, Nov. 3, 1980, abandoned. This application Jun. 25, 1982, Ser. No. 392,392

Int. Cl.³ C08K *5/09*

U.S. Cl. 524—399 6 Claims

1. An impact resistant resin composition which comprises an intimate mixture of (1) a copolymer produced by the polymerization of a major proportion of a mono-unsaturated nitrile and a minor proportion of at least one monovinyl monomer component copolymerizable therewith in the presence of a preformed diene rubber; and (2) a metal carboxylate selected from the group consisting of calcium pelargonate, calcium laurate, aluminum pelargonate, aluminum laurate and aluminum distearate.

4,450,255

ALUMINA-CONTAINING ORGANOSILICON RESINS

Ronald H. Baney, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Filed Jan. 10, 1983, Ser. No. 456,657

Int. Cl.³ C08K *3/22*

U.S. Cl. 524—430 20 Claims

1. A composition of matter comprising colloidal aluminum oxide and colloidal silica in a water-alcohol solution of the partial condensate of a silanol having the formula $RSi(OH)_3$ in which R is selected from the group consisting of alkyl radicals of 1 to 3 inclusive carbon atoms or the phenyl radical, at least 10 weight percent of the silanol being $CH_3Si(OH)_3$, said composition containing 1 to 45 weight percent solids, said solids consisting essentially of 1 to 60 weight percent of colloidal aluminum oxide, 1 to 50 weight percent of colloidal silica and 35 to 90 weight percent of said partial condensate.

4,450,256

PROCESS FOR PRODUCING THERMOPLASTIC RESIN

Sigemi Matsumoto, Takasago, and Fumiya Nagoshi, Kobe, both of Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Jan. 12, 1983, Ser. No. 457,378

Claims priority, application Japan, Jan. 12, 1982, 57-3769

Int. Cl.³ C08F *279/04*

U.S. Cl. 525—316 1 Claim

1. A process for producing a thermoplastic resin which is outstanding in impact resistance and heat distortion resistance and is discolored only little by heat, said process comprising the steps of:

polymerizing, in the presence of diene type synthetic rubber, 2 to 40 parts by weight of a monomer mixture (A) composed of acrylonitrile and styrene, the ratio of acrylonitrile to styrene being 10–40/90–60 by weight,

adding 50 to 90 parts by weight of (B) a monomer mixture containing more than 80 wt% of α-methylstyrene, after most of monomer mixture (A) has polymerized, and then

stepwise adding (C) a monomer mixture containing more than 70 wt% of acrylonitrile while continuing polymerization, the ratio of α-methylstyrene to acrylonitrile in monomer mixtures (B) and (C) being 95–65/5–35 by weight,

whereby 95 to 70 parts by weight of mixture of monomers containing acrylonitrile, styrene and α-methyl styrene are polymerized in the presence of 5 to 30 parts by weight of said diene type synthetic rubber.

4,450,257

PROCESS FOR PRODUCING PHOSPHORIC ACID GROUP CONTAINING POLYESTER RESINS AND THEIR USE AS PAINT BINDERS

Lukas K. Behmel, and Bertram Zückert, both of Graz, Austria, assignors to Vianova Kunstharz, A.G., Werndorf, Austria

Filed Jul. 28, 1983, Ser. No. 517,952

Claims priority, application Austria, Jul. 29, 1982, 2923/82; Apr. 14, 1983, 1326/83

Int. Cl.³ C08G *63/76*

U.S. Cl. 525—437 12 Claims

1. A process for producing polyester resins containing phosphoric acid groups with substantial total linking of the phosphoric acid or derivative thereof to the polyester resin system, characterized in that at least 0.1 mole/kg of the polyacid of the final product is phosphoric in the form of polyphosphoric acid; an acidic phosphoric acid ester of mono- or polyhydric alcohols, and mixtures thereof; the esterification reaction of the polyester components and the phosphoric acid group containing component being carried out in a 40 to 80 percent by weight of solids containing solution of one or more diluents inert towards the raw materials used, the reaction being continued until substantially total linking of the phosphoric acid occurs and the product has an intrinsic viscosity of from about 3.0 to 25.0 ml/g (DMF, 20° C.).

4,450,258

COATING COMPOSITIONS

Denis R. Pauze, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 63,137, Jul. 31, 1979, abandoned, which is a continuation of Ser. No. 923,729, Jul. 11, 1978, Pat. No. 4,218,550, which is a continuation of Ser. No. 538,079, Jan. 2, 1975, abandoned. This application Oct. 7, 1983, Ser. No. 540,084

Int. Cl.³ C08G *18/83*

U.S. Cl. 525—440 9 Claims

1. A polyester urethane containing coating composition having free carboxyl groups wherein all of the free carboxyl

groups are neutralized with a compound selected from the group consisting of amine, ammonia and ammonium hydroxide, said compound being used in at least fifty percent excess over that necessary to neutralize said free carboxyl groups.

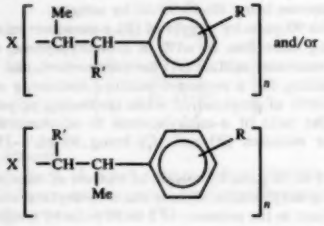
4,450,259

MULTIFUNCTIONAL ANIONIC INITIATORS AND THEIR USE

Arnaldo Roggero; Mario Bruzzone, both of S. Donato Milanese, and Alberto Gandini, Milan, all of Italy, assignors to Enoxy Chimica, S.p.A., Sassari, Italy

Filed Dec. 16, 1982, Ser. No. 450,271
Claims priority, application Italy, Dec. 22, 1981, 25751 A/81
Int. Cl.³ C08F 4/46
U.S. Cl. 526—173 **13 Claims**

1. Multifunctional anionic initiators having the general formula



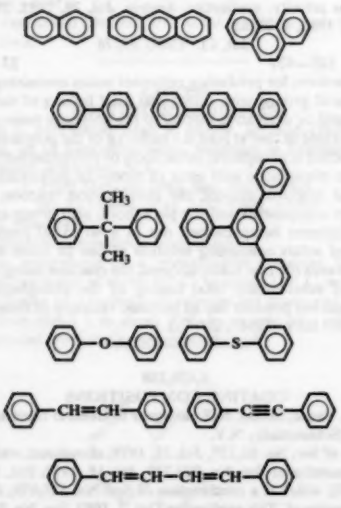
wherein

Me is an alkali metal

n is an integer comprised between 2 and 6 but is preferably 2 and 3

R' is an alkyl, a hydrogen atom or an amide group

X is a divalent or a polyvalent derivatives of the following structures:



and R is hydrogen, an alkyl radical (having preferably a tertiary carbon atom directly bonded to the aromatic ring), a cycloalkyl radical, an alkoxy radical or an aromatic radical and contains from 0 to 18 carbon atoms.

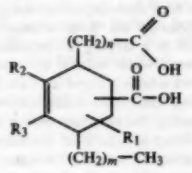
4,450,260

EMULSION POLYMERIZATION

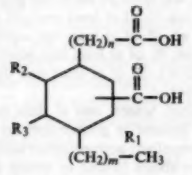
George A. Von Bodungen, and Rudy F. Karg, both of Baton Rouge, La., assignors to Copolymer Rubber & Chemical Corp., Baton Rouge, La.

Filed Feb. 7, 1983, Ser. No. 464,706
Int. Cl.³ C08F 2/26
U.S. Cl. 526—213 **21 Claims**

1. In a process for the emulsion polymerization of at least one monomer, the improvement comprising carrying out the emulsion polymerization in the presence of an emulsifier of a diacid derivative of a cyclic or alkene selected from the group consisting of a compound or its salt having the structure:



and a compound or its salt having the structure:



wherein n is an integer from 1 to 25, m is 0 or an integer from 1 to 25 and each of R_1, R_2 and R_3 is selected from the group consisting of hydrogen and C_1 to C_{25} alkyl.

4,450,261

PREPARATION OF LOW MOLECULAR WEIGHT STYRENE-MALEIC ANHYDRIDE COPOLYMERS AND SULFONATED COPOLYMERS THEREOF

Wen B. Chiao, Piscataway, and Dilip K. Ray-Chaudhuri, Bridgewater, both of N.J., assignors to National Starch and Chemical Corporation, Bridgewater, N.J.

Filed Feb. 22, 1983, Ser. No. 468,256
Int. Cl.³ C08F 2/38, 8/36, 236/10
U.S. Cl. 526—214 **19 Claims**

1. An improved process for preparing a copolymer of styrene and maleic anhydride in the molecular weight range of about 500 to 10,000 by polymerizing styrene and maleic anhydride monomers in a molar ratio of about 1:1 to 9:1 in 1,2-dichloroethane at 70°–100° C. in the presence of a free radical generating polymerization catalyst and a mercaptan chain transfer agent, wherein the improvement comprises carrying out the polymerization in the presence of about 0.5–5%, based on the weight of the monomers, of 3-mercaptopropionic acid or methyl-3-mercaptopropionate as the chain transfer agent, whereby a substantially odorless copolymer which remains soluble in said 1,2-dichloroethane results.

4,450,262

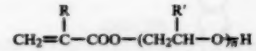
HYDROPHILIC COPOLYMER COMPOSITIONS USEFUL AS CONTACT LENSES

Nancy J. Drake, Painesville, Ohio; Michael D. Hilston, League City, Tex., and Mary A. O'Malley, Cleveland, Ohio, assignors to Diamond Shamrock Chemicals Company, Dallas, Tex.

Filed Aug. 11, 1982, Ser. No. 407,270
Int. Cl.[3] C08F *220/20, 220/28, 220/34*
U.S. Cl. 526—234 10 Claims

1. A hydrophilic copolymer adapted to the fabrication of soft contact lenses resistant to the diffusion of proteins and other lens opacifying agents therein, which polymer comprises

(a) at least about 93% by weight of polymerized units of a hydroxy containing acrylate or alkacrylate having the structural formula:



wherein R represents hydrogen or alkyl from 1 to 6 carbon atoms; R′ represents hydrogen or alkyl from 1 to 6 carbon atoms; and n is an integer of 1 to 6; and

(b) at least about 0.6% to about 7.0% by weight of polymerized units of a p-nitrophenyl acrylate or methacrylate.

4,450,263

FLUOROPOLYMER GUM OF VINYLIDENE FLUORIDE, HEXAFLUOROPROPENE, AND BROMODIFLUOROETHYLENE

Arthur C. West, Maplewood, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 70,926, Aug. 30, 1979, Pat. No. 4,263,414. This application Aug. 29, 1980, Ser. No. 182,608
Int. Cl.[3] C08F *14/16, 14/22, 14/28*
U.S. Cl. 526—249 3 Claims

1. A fluoropolymer gum whose interpolymerized units consist essentially of 60 to 85 mol percent of units derived from vinylidene fluoride, 10 to 40 mol percent of units derived from hexafluoropropene, and 0.15 to 3 mole percent of units derived from 1-bromo-2,2-difluoroethylene, which gum cures in the presence of free-radical initiators under vulcanization conditions to produce an elastomeric vulcanizate.

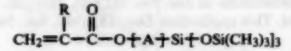
4,450,264

SILOXANE-CONTAINING POLYMERS AND CONTACT LENSES THEREFROM

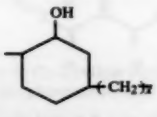
Edward Cho, Westfield, N.J., assignor to Polymatic Investment Corp., N.V., Curacao, Netherlands

Filed Aug. 9, 1982, Ser. No. 406,582
Int. Cl.[3] C08F *30/08, 130/08, 230/08*
U.S. Cl. 526—279 21 Claims

1. An organosiloxane of the formula

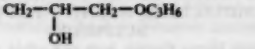


wherein R is hydrogen or methyl, and wherein A is the unit (I)

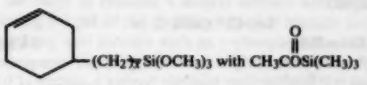


(I)

wherein x is 0 to 4

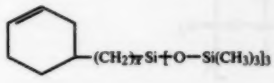


18. A process of preparing compounds of claim 1 comprising (1) reacting a compound of the formula (I)



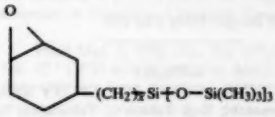
(I)

under acidic conditions to form a compound of the formula II



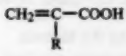
(II)

(2) reacting the thus formed compound (II) with an epoxidizing compound capable of epoxidizing the double bond in the cyclohexene ring to form a compound of the formula (III)



(III)

(3) reacting the compound of formula (III) with a compound of the formula



in the presence of an esterification catalyst to form the compounds of claim 1.

4,450,265

ADDITIVES FOR CYANOACRYLATE ADHESIVES

Stephen J. Harris, Dublin, Ireland, assignor to Loctite Corporation, Newington, Conn.

PCT No. PCT/GB81/00170, 371 Date Apr. 28, 1982, 102(e) Date Apr. 28, 1982, PCT Pub. No. WO82/00829, PCT Pub. Date Mar. 18, 1982
PCT Filed Aug. 27, 1981, Ser. No. 375,140
Claims priority, application Ireland, Aug. 28, 1980, 1812/80
Int. Cl.[3] C08F *120/34*
U.S. Cl. 526—298 5 Claims

1. An adhesive composition comprising a polymerizable constituent the major part of which comprises at least one ester of 2-cyanoacrylic acid, characterized in that the composition additionally comprises a proportion of phthalic anhydride effective for favorably influencing the strength and/or durability of adhesive bonds formed from said composition, under exposure to moisture or elevated temperature.

4,450,266

USE OF SILOXANES FOR THE MODIFICATION OF HIGH MOLECULAR WEIGHT P-POLYPHENYLENE SULPHIDES

Karsten Idel; Dieter Freitag, both of Krefeld, and Josef Merten, Korschenbroich, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

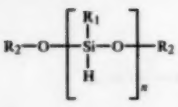
Filed Feb. 8, 1983, Ser. No. 465,012

Claims priority, application Fed. Rep. of Germany, Feb. 19, 1982, 3205993

Int. Cl.³ C08K *5/54*

U.S. Cl. 524—265 **5 Claims**

1. High molecular weight stabilized polymer composition comprising p-polyphenylene sulphide having a content of from 0.1 to 2% by weight, based on the total weight of the composition, of a siloxane of the formula



wherein

R_1 represents a C_1–C_{18} alkyl, C_5–C_6 cycloalkyl, C_2–C_{18} alkenyl, C_5–C_6 cycloalkenyl or C_6–C_{12} aryl,

R_2 has the same meaning as R_1 and may represent trimethylsilyl, and

n represents an integer from 1 to 100.

4,450,267

LATENT CURING AGENTS FOR EPOXY RESINS

Nobuo Ito, Ooisomachi; Koji Takeuchi, Yokohama; Masahiro Abe, Kawasaki, and Tsuneo Ishiguro, Yokosuka, all of Japan, assignors to Ajinomoto Company Incorporated, Tokyo, Japan

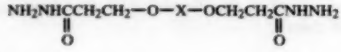
Filed Jan. 19, 1983, Ser. No. 459,214

Claims priority, application Japan, Jan. 29, 1982, 57-12891

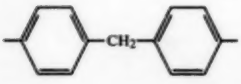
Int. Cl.³ C08G *59/44*

U.S. Cl. 528—99 **13 Claims**

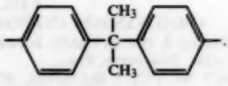
1. A compound having the formula



wherein X is an aromatic hydrocarbon residue of a dihydric phenol,



or



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4,450,268

METAL PHTHALOCYANINE POLYMERS

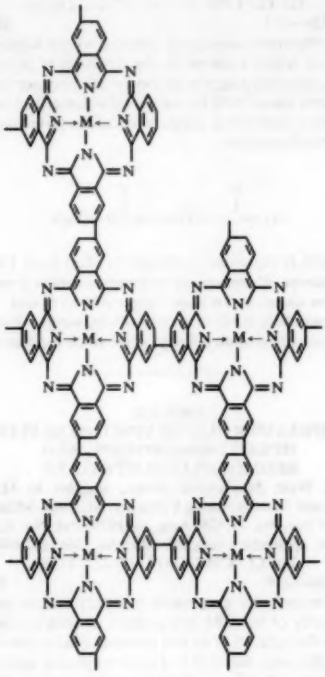
Bappalige N. Achar, Mysore, India; George M. Fohlen, Millbrae, and John A. Parker, Los Altos, both of Calif., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Sep. 8, 1982, Ser. No. 415,880

Int. Cl.³ C08G *73/00*

U.S. Cl. 528—327 **12 Claims**

1. A method of preparing a heat stable and oxidation resistant sheet polymer of a metal phthalocyanine which comprises heating a metal 4,4',4'',4'''-tetracarboxylic phthalocyanine to a temperature sufficient to result in the formation of gaseous products and to form a sheet polymer having the repeating structure



wherein M is a metal.

4,450,269

MONO-5-SUBSTITUTED-3-CHLORO-4H-1,2,6-THIADIAZIN-4-ONE ANTIFUNGAL AGENTS

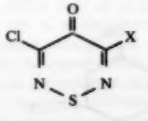
Clinton J. Peake; Wayne N. Harnish, both of Medina, and Bruce L. Davidson, Middleport, all of N.Y., assignors to FMC Corporation, Philadelphia, Pa.

Continuation of Ser. No. 904,828, May 11, 1978, abandoned, which is a continuation of Ser. No. 782,860, Mar. 30, 1977, Pat. No. 4,097,594. This application Dec. 18, 1980, Ser. No. 217,644

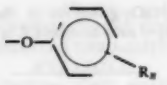
Int. Cl.³ C07D *285/16*

U.S. Cl. 544—8 **6 Claims**

1. A compound of the formula



in which X is naphthoxy or substituted phenoxy having the formula



wherein each R group is a substituent independently selected from the group consisting of lower alkyl, halo, hydroxy, lower alkoxy, nitro, cyano, amino, carboxyl, lower acyl, lower acylamino, lower alkoxycarbonyl, carboxy(lower)alkyl, lower alkylureido, phenylureido, trihalomethyl, cyano(lower)alkyl, phenyl(lower)alkoxycarbonyloxy, lower alkylaminocarbonyloxy, phenylaminocarbonyloxy, lower alkylthio, lower alkylsulfinyl and lower alkylsulfonyl, wherein n has a value of 1 to 3 inclusive, except when each R is halogen when n has a value of 1 to 5 inclusive.

4,450,270

DIOXIMINO CEPHALOSPORIN ANTIBIOTICS

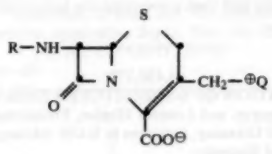
William H. W. Lunn, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 307,983, Oct. 2, 1981, Pat. No. 4,402,955. This application Jun. 3, 1983, Ser. No. 500,729

Int. Cl.³ C07D *501/38;* **A61K** *31/545*

U.S. Cl. 544—24 **3 Claims**

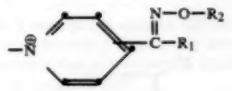
1. A compound of the formula

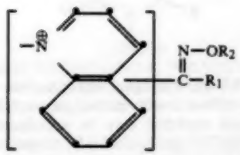


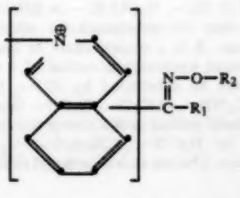
wherein

R is hydrogen, or formyl

Q is an oximino substituted pyridinium, quinolinium or isoquinolinium group of the formulas







wherein

R_1 is hydrogen or C_1–C_3 alkyl; R_2 is hydrogen or C_1–C_3 alkyl; and the pharmaceutically acceptable non-toxic salts thereof.

4,450,271

PREPARATION OF 2-HYDROXYQUINOXALINE

Tsung-Tsan Su, and Yu-Chen Cheng, both of Hsinchu, Taiwan, assignors to Industrial Technology Research Institute, Hsinchu, Taiwan

Filed Jul. 19, 1982, Ser. No. 399,275

Int. Cl.³ C07D *241/44*

U.S. Cl. 544—354 **3 Claims**

1. A process for preparing 2-hydroxyquinoxalines comprising the steps of reacting a dialkyl tartrate with a periodate, adjusting the pH of the resulting reaction mixture to 6–7, and condensing said mixture with an o-phenylenediamine.

4,450,272

ANTIATHEROSCLEROTIC 1-PIPERAZINE-THICARBOXAMIDES

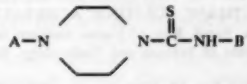
Mila T. Du, Suffern, N.Y., and Robert G. Shepherd, Selbyville, Del., assignors to American Cyanamid Company, Stamford, Conn.

Filed May 6, 1982, Ser. No. 375,526

Int. Cl.³ C07D *403/04, 401/04;* **A61K** *31/495*

U.S. Cl. 544—357 **6 Claims**

1. A compound of the formula:



wherein A is selected from the group consisting of pyrazinyl, quinolyl, and methoxypyrazinyl and B is selected from the group consisting of, benzyl, phenethyl, and phenyl substituted with at least one substituent selected from the group consisting of C_1–C_4 carboalkoxy, carboxy, and cyano.

4,450,273

NN' PARA METHOXY BENZYL PERYLENE-3,4,9,10-TETRACARBOXYLIC ACID DIIMIDE

Fritz Graser, Ludwigshafen, Fed. Rep. of Germany, assignor to BASF Aktiengeselischaft, Rheinland-Pfalz, Fed. Rep. of Germany

Filed Jan. 6, 1982, Ser. No. 337,506

Claims priority, application Fed. Rep. of Germany, Jan. 22, 1981, 3101885

Int. Cl.³ C09B *5/62*

U.S. Cl. 546—37 **1 Claim**

1. A perylene-3,4,9,10-tetracarboxylic diimide of the formula

4,450,274

PREPARATION OF ETHAMBUTOL-DIISONIAZIDE METHANE SULFONIC ACID SALT

Sang-Woo Park, Seoul, Rep. of Korea, assignor to Korean Advanced Institute of Science and Technology, Seoul, Rep. of Korea

Filed Jun. 10, 1982, Ser. No. 387,037
Claims priority, application Rep. of Korea, Jul. 7, 1981, 2455
Int. Cl.³ C07D *401/12*
U.S. Cl. 546—262 10 Claims

1. A process for preparing an d(+) 2,2-(ethylene diimino) dibutanol-diisoniazide-methane-sulfonate comprising reacting isoniazid with ethylene diimino dibutanol-chloro-methane sulfonate.

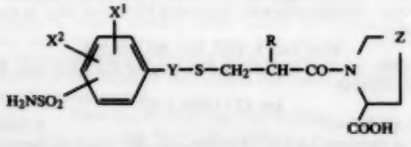
4,450,275

CYCLIC IMINOCARBOXYLIC ACID DERIVATIVES

Katsuo Arimura, Oita; Shu Murakami, Fukuoka, and Taichi Oka, Oita, all of Japan, assignors to Yoshitomi Pharmaceutical Industries, Ltd., Osaka, Japan

PCT No. PCT/JP79/00249, 371 Date Jun. 5, 1980, 102(e) Date Jun. 5, 1980, PCT Pub. No. WO80/00700, PCT Pub. Date Apr. 17, 1980
PCT Filed Sep. 28, 1980, Ser. No. 227,104
Claims priority, application Japan, Oct. 5, 1978, 53-123189
Int. Cl.³ C07D *207/16, 277/04*
U.S. Cl. 548—201 3 Claims

1. A cyclic iminocarboxylic acid of the formula



or a salt thereof, wherein X^1 is chlorine at the 4-position, X^2 is hydrogen, the H_2NSO_2-group is at the 3-position, Y is —CO—, Z is $—CH_2—$ or —S—, and R is hydrogen or lower alkyl.

4,450,276

PROCESS FOR THE PREPARATION OF D(+)-BIOTIN

Jürgen Gehlhaus, Port Chester, N.Y., and Claus P. Herz, Heidelberg, Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft mit beschränkter Haftung, Darmstadt, Fed. Rep. of Germany

Filed Jun. 7, 1982, Ser. No. 386,134
Claims priority, application Fed. Rep. of Germany, Jun. 6, 1981, 3122562
Int. Cl.³ C07D *495/04*
U.S. Cl. 548—303 5 Claims

1. In a process for preparing D(+)-biotin comprising reacting a 3,4-isopropylidine-D-arabinose with alkoxycarbonylprop-1-en-3-ylidenetriphenylphosphorane to give a product from which an ester of 6,9-dihydroxy-7,8-isopropylidenedioxynonanoic acid is obtained and converting the latter into D(+)-biotin, the improvement, comprising reacting 3,4-isopropylidene-D-arabinose in which the OH group in the 2-position is not protected, with said phosphorane essentially in the absence of alkaline components, to produce the corresponding ester of 6,9-dihydroxy-7,8-isopropylidenedioxynona-2,4-dienoic acid; catalytically hydrogenating the latter to form the corresponding ester of 6,9-dihydroxy-7,8-isopropylidenedioxynonanoic acid; and then converting the latter into D(+)-biotin.

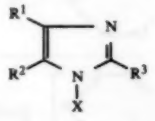
4,450,277

PREPARATION OF 1-SUBSTITUTED IMIDAZOLES

Fritz Graf, Speyer, and Leopold Hupfer, Friedelsheim, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Sep. 25, 1980, Ser. No. 190,901
Claims priority, application Fed. Rep. of Germany, Oct. 8, 1979, 2940709
Int. Cl.³ C07D *233/58, 233/60, 233/61*
U.S. Cl. 548—346 3 Claims

1. A process for the preparation of imidazoles of the formula



where R^1 and R^2 are hydrogen, straight-chain or branched alkyl of 1 to 5 carbon atoms, phenyl or naphthalene which alkyl, phenyl and naphthyl may be substituted by HO—, $H_3COOC—$ or $H_3CO—$groups, R^3 is hydrogen, straight-chain or branched alkyl of 1 to 8 carbon atoms which may be substituted by phenyl or HO—, $H_3COOC—$ or $H_3CO—$groups, or phenyl which may be substituted by alkyl, HO— or $H_3COOC—$groups, X is a straight-chain or branched, saturated or unsaturated hydrocarbon radical of 1 to 20 carbon atoms which may be substituted by HO—, $CH_3—NH—$, $(CH_3)_2N—$, $H_5C_2NH—$, $H_5C_2O—$, $H_3CO—$ or ether groups, or is a cycloaliphatic radical or is a phenyl radical which may be substituted by $H_3CO—$, $(CH_3)_2N—$, $H_5C_2NH—$ or $H_3COOC—$groups, wherein an α-dicarbonyl compound of the formula

$$R^1—CO—CO—R^2,$$

ammonia, an aldehyde of the formula $R^3—COH$ and a primary amine of the formula $X—NH_2$ are reacted in one step at from 20° to 150° C.

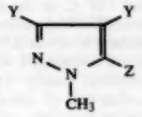
4,450,278

INTERMEDIATES FOR 1-METHYL-3,4-DIHALO-5-THIO-(2-HYDROXYETHYL)-PYRAZOLE

Edward I. Aoyagi, Petaluma, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Jun. 28, 1982, Ser. No. 393,214
Int. Cl.³ C07D 231/18
U.S. Cl. 548—376 2 Claims

1. A compound of the formula:



wherein Y is chloro or bromo, and Z is the group —SCH_2C-H_2OH—.

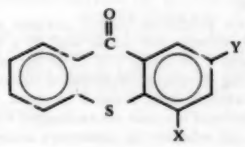
4,450,279

DIALKYLTHIOXANTHONES

Tsutomu Shirosaki, Tokyo, and Seiki Fukunaga, Yono, both of Japan, assignors to Nippon, Kayaku, Kabushiki, Kaisha, Tokyo, Japan

Filed Mar. 2, 1982, Ser. No. 354,230
Claims priority, application Japan, Mar. 16, 1981, 56-36493
Int. Cl.³ C07D 335/16
U.S. Cl. 549—27 4 Claims

1. A dialkylthoxanthone compound of the general formula:



(I)

wherein X and Y may be the same or different, and represent a straight-chain or branched alkyl group having 1–12 carbon atoms with a proviso that sum of carbon atoms of alkyl groups X and Y is in the range of 3–15.

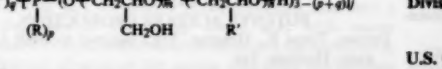
4,450,280

PHOSPHOROUS-CONTAINING POLYETHER POLYOLS

Chester E. Pawloski, Bay City, and Sally P. Ginter, Sanford, both of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Mar. 4, 1982, Ser. No. 354,567
Int. Cl.³ C07F 9/40; C07D 317/24
U.S. Cl. 549—221 7 Claims

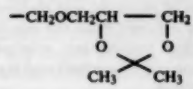
1. A phosphorus-containing polyether polyol corresponding to the formula:



wherein:

R is a monovalent moiety having up to 6 carbons selected from the group consisting of alkyl, phenyl, haloalkyl, halophenyl, alkoxy and haloalkoxy;

R′ is C_{1-6} alkyl, C_{1-6} haloalkyl, phenyl, halophenyl, tertiary alkoxy methyl, phenoxy methyl, halophenoxy methyl, or



R″ is a moiety of valence j having up to 10 carbons selected from the group consisting of R, alkanediyl, alkanetriyl, alkanetetryl, alkenylene, alkylenedioxy and halo-, haloalkyl-, phenyl- or halophenyl-substituted derivatives thereof;

j is an integer from 1 to 4;

k is zero or one;

m is a positive rational number less than about 25;

n is a rational number from zero to about 25; and

p and q are integers independently equal to either zero or 1.

4,450,281

PROCESS FOR THE PREPARATION OF A POLYALKENYL SUCCINIC ANHYDRIDE

Robert H. Wollenberg, San Rafael, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Dec. 29, 1982, Ser. No. 454,398
Int. Cl.³ C07D 307/60
U.S. Cl. 549—255 8 Claims

1. In a method for preparing a substituted carboxylic acid or derivative thereof which comprises reacting (A) an alkylating hydrocarbon containing two or more double bonds with (B) at least one of maleic acid, fumaric acid, itaconic acid and anhydrides and esters of any of these acids, at least part of the reaction being conducted thermally, the improvement which comprises conducting said thermal reaction in the presence of a furan-type compound.

4,450,282

CATALYST FOR A PROCESS FOR PRODUCING SILICONES

Alan Ritzer, Sand Lake, and Heine Lapidot, Latham, both of N.Y., assignors to General Electric Company, Waterford, N.Y.

Filed Jul. 29, 1981, Ser. No. 288,175
Int. Cl.³ C07F 7/16
U.S. Cl. 556—472 39 Claims

1. An efficient direct process for producing organohalosilanes and particularly diorganodihalosilanes, comprising (1) passing an organohalide in contact with metal in the presence of a catalyst comprising partially oxidized copper particles having a surface areas of at least 3.5 meters square per gram as determined by the B.E.T. Method wherein the catalyst particles have a particle size distribution in which 100% of the particles are less than 35 μm and 100% of the particles are greater than 0.7 μm, and (2) removing a product stream of organohalosilanes from the reaction area where the organo group is a monovalent hydrocarbon radical.

4,450,283

PLATINUM-STYRENE COMPLEXES WHICH PROMOTE HYDROSILATION REACTIONS

Richard C. McAfee, Tecumseh; James Adkins, Adrian, and Richard L. Miskowski, Jackson, all of Mich., assignors to SWS Silicones Corporation, Adrian, Mich.

Division of Ser. No. 230,462, Feb. 2, 1981, Pat. No. 4,394,317.
This application Feb. 18, 1983, Ser. No. 468,118
Int. Cl.³ C07F 7/08, 7/10, 7/18
U.S. Cl. 556—479 10 Claims

1. A process for the addition of an organosilicon compound containing silicon-bonded hydrogen to an organic compound having carbon-carbon unsaturation which comprises mixing an organosilicon compound having silicon-bonded hydrogen with an organic compound having carbon-carbon unsaturation in the presence of a platinum-olefinic hydrocarbon complex

containing more than one but less than 4 gram atoms of halogen per gram atom of platinum, said platinum-olefinic hydrocarbon complex is obtained from the reaction of a platinum halide and an olefinic hydrocarbon selected from the group consisting of styrene and ring substituted styrenes in the presence of a basic material.

4,450,284

METHOD FOR PURIFYING N-BENZYLOXYCARBONYL ASPARTIC ACID

Avinash T. Sathe, Mundelein, Ill., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 291,584, Aug. 10, 1981, abandoned. This application Apr. 7, 1983, Ser. No. 483,057

Int. Cl.³ C07C *125/06*

U.S. Cl. 560—163 **19 Claims**

1. A process for purifying N-benzyloxycarbonyl aspartic acid containing minor contaminating amounts of N-benzyloxycarbonyl aspartyl aspartic acid, which comprises (a) admixing alkali metal hydroxide with an aqueous slurry of said contaminated N-benzyloxycarbonyl aspartic acid until the pH of the resulting aqueous solution is within the range of from about 10 to 12, digesting said resulting aqueous solution within said pH range and at temperatures of from 30° C. to 100° C. for a time sufficient to hydrolyze substantially all of the N-benzyloxycarbonyl aspartyl aspartic acid (b) acidifying the digested aqueous solution with mineral acid, thereby to crystallize N-benzyloxycarbonyl aspartic acid substantially free of N-benzyloxycarbonyl aspartyl aspartic acid, and (c) recovering said crystallized N-benzyloxycarbonyl aspartic acid.

10. A process for purifying N-benzyloxycarbonyl aspartic acid containing minor contaminating amounts of N-benzyloxycarbonyl aspartyl aspartic acid, which comprises digesting an aqueous solution of an alkali metal salt of said N-benzylcarbonyl aspartic acid at a pH of from about 10 to less than 12 and at temperatures of from 50° C. to 100° C. for a time sufficient to hydrolyze substantially all of the N-benzyloxycarbonyl aspartyl aspartic acid.

4,450,285

PREPARATION OF ESTERS

Edmund P. Woo, and Daniel J. Murray, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Feb. 22, 1982, Ser. No. 350,853

Int. Cl.³ C07C *67/36*

U.S. Cl. 560—206 **10 Claims**

1. A process for the preparation of a β,γ-unsaturated ester corresponding to the formula:

$$R_1R_2C{=}CR_3CR_4R_5C(O)OR_6$$

wherein:

R_1–R_5 independently each occurrence are selected from the group consisting of hydrogen and R_6; and

R_6 is a moiety of up to about 10 carbons selected from the group consisting of alkyl, aryl, alkenyl and halo-, cyano-, nitro-, alkoxycarbonyl- or alkoxy-substituted derivatives thereof,

which comprises contacting a β,γ-unsaturated carbonate compound corresponding to the formula

$$R_1R_2C{=}CR_3CR_4R_5OC(O)OR_6,$$

wherein R_1–R_6 are as previously defined, with carbon monoxide at elevated temperatures and pressures in the presence of a metal catalyst capable of catalyzing the carbonylation reaction selected from the metals of group VIII of the Periodic Table.

4,450,286

BUTENYL ACETATE PRODUCTION

Timm E. Paxson, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed May 21, 1982, Ser. No. 380,637

The portion of the term of this patent subsequent to May 22, 2001, has been disclaimed.

Int. Cl.³ C07C *67/04, 69/145*

U.S. Cl. 560—241 **3 Claims**

1. A process for producing butenyl acetate which comprises reacting butadiene and acetic acid at a temperature ranging from about 0° to about 150° C. in the presence of a catalyst comprising styrene-divinylbenzene sulfonic acid ion exchange resin wherein from about 2 to about 20% of the sulfonic acid moieties of the resin are exchanged with a ferrocenyl salt having a cationic ferrocenyl moiety wherein the ferrocenyl moiety is substituted with one or more moieties having the following general formula

$$-CH_2)_nX^+R_1R_2R_3$$

where n ranges from 0 to about 10; R_1, R_2 and R_3 are alkyl having carbon numbers ranging from 1 to about 20, X is nitrogen or phosphorus, and an anionic moiety selected from hydroxide or an anion from a strong or weak acid.

4,450,287

BUTENYL ACETATE PRODUCTION

Timm E. Paxson, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed May 21, 1982, Ser. No. 380,638

The portion of the term of this patent subsequent to May 22, 2001, has been disclaimed.

Int. Cl.³ C07C *67/04, 69/145*

U.S. Cl. 560—241 **5 Claims**

1. A process for producing butenyl acetates which comprises reacting butadiene and acetic acid at a temperature ranging from about 0° to about 150° C. in the presence of a catalyst comprising styrene-divinylbenzene sulfonic acid ion exchange resin wherein from about 2 to about 20% of the sulfonic acid moieties of the resin are exchanged with a quaternary ammonium salt wherein the quaternary ammonium moiety of the quaternary ammonium salt has a carbon number of greater than about 30.

4,450,288

BUTENYL ACETATE PRODUCTION

Timm E. Paxson, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed May 21, 1982, Ser. No. 380,639

The portion of the term of this patent subsequent to May 22, 2001, has been disclaimed.

Int. Cl.³ C07C *67/04, 69/145*

U.S. Cl. 560—241 **4 Claims**

1. A process for producing butenyl acetates which comprises reacting butadiene and acetic acid at a temperature ranging from about 0° to about 150° C. in the presence of a catalyst comprising styrene-divinylbenzene sulfonic acid ion exchange resin wherein from about 2 to about 20% of the sulfonic acid moieties of the resin are exchanged with an alkyl pyridinium salt.

4,450,289

BUTENYL ACETATE PRODUCTION

Paxson, Timm E., Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed May 21, 1982, Ser. No. 380,640

The portion of the term of this patent subsequent to May 22, 2001, has been disclaimed.

Int. Cl.³ C07C *67/04, 69/145*

U.S. Cl. 560—241 **5 Claims**

1. A process for producing butenyl acetates which com-

prises reacting butadiene and acetic acid at a temperature ranging from about 0° to about 150° C. in the presence of a catalyst comprising styrene-divinylbenzene sulfonic acid ion exchange resin wherein from about 2 to about 20% of the sulfonic acid moieties of the resin are exchanged with a quaternary phosphonium salt wherein the quaternary phosphonium moiety of the quaternary phosphonium salt has a carbon number of greater than about 15.

4,450,290

ALKANE ACETATES PRODUCED BY OXIDATIVE ESTERIFICATION OF OLEFINS OVER TRANSITION METAL BORATES IN THE PRESENCE OF ACETIC ACID

John R. Sanderson; Lewis W. Watts, Jr., and Walter H. Brader, Jr., all of Austin, Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Jul. 28, 1982, Ser. No. 402,663
Int. Cl.³ C07C 67/05
U.S. Cl. 560—246 9 Claims

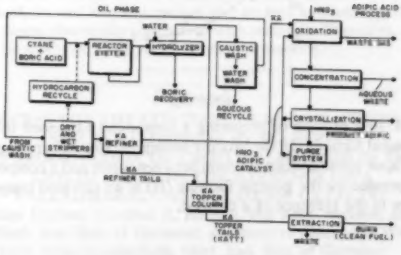
1. An improved process for the production of alkane hydroxy acetates and diacetates by reacting an olefin or a mixture of olefins with oxygen and acetic acid, wherein the improvement comprises conducting the reaction in the presence of one or more transition metal borate catalysts in which the transition metal is selected from the group of elements consisting of manganese, cobalt, nickel, yttrium and zirconium.

4,450,291

DECONTAMINATION OF KA OIL REFINEMENT WASTE STREAM

Ching T. Chi, and J. Harvey Lester, Jr., both of Pensacola, Fla., assignors to Monsanto Company, St. Louis, Mo.

Filed May 2, 1983, Ser. No. 490,636
Int. Cl.³ C07C 51/245
U.S. Cl. 562—530 14 Claims



1. A process for the decontamination of a waste stream refinement residue from the process comprising oxidizing cyclohexane to KA oil, the waste stream residue comprising high boiling organics, and caustic, the process comprising washing the residue with a by-product of the process comprising:

(a) oxidizing KA oil with a strong oxidizing acid into a product stream comprising adipic acid with minor amounts of glutaric and succinic acids and the strong acid;

(b) removal of most of the strong acid from the product stream;

(c) crystallizing adipic acid from the product leaving the by-product stream comprising glutaric acid, succinic acid, residual amounts of adipic acid, residual amounts of the strong oxidizing acid, and water.

4,450,292

DERIVATIVES OF PHENYL ALIPHATIC CARBOXYLIC ACIDS, AND USE THEREOF IN TREATING GASTRIC AND GASTRO-DUODENAL AILMENTS

Yani Christidis, and Robert Fournex, both of Paris, France, assignors to Roussel Uclaf, Paris, France

Filed Apr. 14, 1982, Ser. No. 368,208
Claims priority, application France, Apr. 17, 1981, 81 07801
Int. Cl.³ C07C 65/03
U.S. Cl. 562—463 3 Claims

1. A compound selected from the group consisting of 4-(3,4,5-trimethoxyphenyl)-4-oxo-2-butenoic acid, and pharmaceutically acceptable alkali metal, alkaline-earth metal, and amine salts thereof.

4,450,293

PREPARATION OF α-HYDROXYISOBUTYRIC ACID USING A THALLIC HALIDE CATALYST

John A. Sofranko, West Chester, and John J. Leonard, Springfield, both of Pa., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Dec. 13, 1982, Ser. No. 449,300
Int. Cl.³ C07C 59/00
U.S. Cl. 562—579 14 Claims

1. A process for the preparation of α-hydroxyisobutyric acid which comprises reacting in an aqueous solution isobutyric acid with molecular oxygen at partial pressures of between about 1 psig to 500 psig and at a temperature in the range of about 75° C. to 250° C. in the presence of a catalyst mixture of

(a) from about 0.1 to 10 weight percent of a Tl^{+3} halide salt selected from thallic chloride and thallic bromide, or mixtures thereof,

(b) from 0.1 to 10 weight percent of a copper (I), copper (II), tin (II), tin (IV), iron (II) or iron (III) bromide or chloride co-oxidant salt or mixtures thereof, and recovering the desired α-hydroxyisobutyric acid.

4,450,294

PROCESS FOR RECOVERING OXYGENATED ORGANIC COMPOUNDS FROM DILUTE AQUEOUS SOLUTIONS EMPLOYING SOLID SORBENT

Julian Feldman, Cincinnati, Ohio, assignor to National Distillers and Chemical Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 325,450, Nov. 27, 1981, Pat. No. 4,359,593. This application Nov. 1, 1982, Ser. No. 438,068
The portion of the term of this patent subsequent to Nov. 16, 1999, has been disclaimed.
Int. Cl.³ C07C 41/36, 45/79, 51/47, 29/76
U.S. Cl. 562—608 9 Claims

1. A process for recovering an oxygenated organic compound from a dilute aqueous solution thereof which comprises contacting said dilute aqueous solution with crosslinked polyvinylpyridine resin or nuclear substituted derivative thereof under such conditions that at least a portion of the compound will be sorbed by said resin and thereafter desorbing the compound from said resin.

4,450,295

METHOD OF MANUFACTURING ANHYDROUS 2-HYDROXY-3-CHLOROPROPANE TRIMETHYLAMMONIUM CHLORIDE

Hendrikus J. H. van der Mass, Zaandam, Netherlands, assignor to Chemische Fabriek Zaltbommel, B.V., Zaltbommel, Netherlands

Filed Dec. 18, 1981, Ser. No. 332,117
Claims priority, application Netherlands, Dec. 31, 1980, 8007126
Int. Cl.³ C07C 89/00
U.S. Cl. 564—294 5 Claims

1. Process for manufacturing anhydrous 2-hydroxy-3-chloropropane trialkylammonium chloride by the conversion of trialkylammonium chloride with epichlorohydrin, which

process comprises forming an aqueous solution of the trialkylammonium chloride in an organic solvent which is non-reactive towards epichlorohydrin and does not readily form a solution with water but combines with water to form an azeotrope which boils at temperatures up to the boiling point of the solvent, except for tetrachloroethane; distilling off the azeotrope as it is formed, separating off the water to form a suspension of trialkylammonium chloride in solvent reaction product; and reacting the reaction product in the solvent with epichlorohydrin at a temperature of 20° to 120° C.

4,450,296

PROCESS FOR THE PRODUCTION OF ARYLALKANONE AND INTERMEDIATE

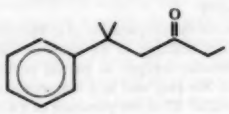
Takao Yoshida, West Long Branch, N.J., assignor to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 188,563, Sep. 18, 1980, Pat. No. 4,298,542. This application Feb. 5, 1981, Ser. No. 231,772

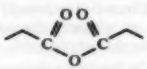
Int. Cl.³ C07C *45/45*

U.S. Cl. 568—316 **1 Claim**

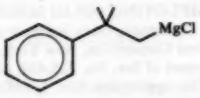
1. A process for preparing 2-methyl-2-phenyl-4-hexanone having the structure:



comprising the step of intimately admixing propionic anhydride having the structure:



with neophymagnesium chloride having the structure:



in the presence of an inert solvent selected from the group consisting of diethylether, toluene and tetrahydrufuran, the reaction taking place in the presence of or in the absence of a cuprous chloride catalyst; the mole ratio of propionic anhydride:neophylmagnesium chloride being from 0.5:1 up to about 2:1; the temperature of reaction being from −10° C. up to 0° C.; the concentration of propionic anhydride in solvent being from about 1 up to about 5 moles of propionic anhydride per liter of solvent; the time of addition of one reactant to the other varying from 0.5 hours up to 4 hours and the time of aging of the reaction mass being from 0.5 up to 4 hours.

4,450,297

PREPARATION OF O-NITROBENZALDEHYDE

Michael Preiss; Wolfgang Gau, both of Wuppertal, and Horst Behre, Odenthal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Mar. 17, 1983, Ser. No. 476,093

Claims priority, application Fed. Rep. of Germany, Apr. 1, 1982, 3212069

Int. Cl.³ C07C *45/78, 79/36, 76/06*

U.S. Cl. 568—424 **6 Claims**

1. A process for the preparation of o-nitrobenzaldehyde, comprising converting to the corresponding acetals a mixture of nitrated benzaldehyde which contains about 10 to 30% of o-nitrobenzaldehyde and about 70 to 90% of m-nitrobenzaldehyde, removing the o-nitrobenzaldehyde acetal by distillation, and then converting the o-nitrobenzaldehyde acetal to o-nitrobenzaldehyde.

4,450,298

VAPOR PHASE CATALYTIC HYDROLYSIS OF BENZAL CHLORIDE OR ITS HALOGEN- OR TRIFLUOROMETHYL-SUBSTITUTE TO FORM BENZALDEHYDE OR SUBSTITUTE

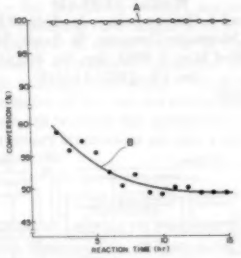
Takeshi Kondow, Kamifukuoka; Koshi Okazaki, Saitama; Yutaka Katsuhara, and Kiminki Matsuoka, both of Kawagoe, all of Japan, assignors to Central Glass Company, Limited, Ube, Japan

Filed Jul. 20, 1982, Ser. No. 400,011

Claims priority, application Japan, Jul. 21, 1981, 56-112977; Aug. 12, 1981, 56-125374

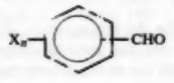
Int. Cl.³ C07C *45/43*

U.S. Cl. 568—437 **15 Claims**

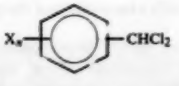


1. In a process of preparing a compound expressed by the general formula (I), the process having the step of carrying out a vapor phase contact reaction between water and a compound expressed by the general formula (II) at an elevated temperature in the presence of a catalyst,

(I)



(II)



in both the formulas (I) and (II) X representing a halogen atom or a trifluoromethyl group and n being 0, 1 or 2,

the improvement comprising said catalyst comprising activated carbon treated with an inorganic acid selected from the group consisting of sulfuric acid, hydrofluoric acid and phosphoric acid.

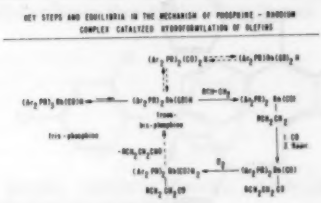
4,450,299
HOMOGENEOUS HYDROFORMYLATION CATALYSIS WITH SILYL SUBSTITUTED ALKYL DIARYL PHOSPHINE METAL COMPLEXES

Alexis A. Oswald, Mountainside, N.J.; Torris G. Jermansen, Staten Island, N.Y.; Andrew A. Westner, Paramus, and I-Der Huang, Upper Saddle River, both of N.J., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Continuation-in-part of Ser. No. 192,810, Oct. 1, 1980, which is a division of Ser. No. 11,238, Feb. 12, 1979, Pat. No. 4,298,541. This application Aug. 21, 1981, Ser. No. 295,193

Int. Cl.³ C07C *49/50*

U.S. Cl. 568—454 **56 Claims**



1. A hydroformylation process for converting a C_n olefinically unsaturated organic compound to a C_{n+1} aldehyde comprising reacting an olefinically unsaturated organic compound with CO and H_2 at a temperature in the range of about 50° to 200° C. and a total pressure in the range of about 15 to 2000 psia, in the presence of a reaction mixture comprising a homogeneous, non-charged catalyst complex of the formula:

$$[(Ar_2PQ)_ySiR_{4-y}]_g(MX_n)_s$$

wherein Ar is a substituted or unsubstituted C_6 to C_{10} aromatic radical, Q is an unsubstituted or substituted C_1 to C_{30} saturated open chain alkylene radical; R is an unsubstituted or monosubstituted C_1 to C_{10} hydrocarbyl radical, M is a Group VIII transition metal selected from the group consisting of Co, Rh, Ir, Ru, Fe or Os, X is an anion or organic ligand, excluding halogen, satisfying the valence and coordination sites of the metal, y is 1 to 4, g is 1 to 6 with the proviso that g times y is 1 to 6, n is 2 to 6, s is 1 to 3, said substituents on said aromatic radical, on said alkylene radical and on said hydrocarbyl radical, being chemically unreactive with materials 20 used in, and the products of, the hydroformylation reaction.

4,450,300
PROCESS FOR THE CONTINUOUS MANUFACTURE OF N-BUTYRALDEHYDE BY SELECTIVE HYDROGENATION OF CROTONALDEHYDE IN THE LIQUID PHASE IN THE PRESENCE OF A PALLADIUM-ALUMINUM OXIDE CATALYST

Lothar Fischer; Manfred Z. Hausen, and Kurt Wember, all of Marl, Fed. Rep. of Germany, assignors to Chemische Werke Huels Aktiengesellschaft, Marl, Fed. Rep. of Germany

Filed Mar. 12, 1982, Ser. No. 357,451

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1981, 3151086

Int. Cl.³ C07C *45/62*

U.S. Cl. 568—462 **12 Claims**

1. A process for the continuous production of n-butyraldehyde by selective hydrogenation of crotonaldehyde, comprising conducting the hydrogenation in the liquid phase in the presence of hydrogen and in the presence of a palladium-aluminum oxide supported catalyst, under an absolute pressure of 5–50 bar and at a temperature of 20°–100° C. with a flow rate under STP conditions for crotonaldehyde in the range of 0.3–1.0 l/l catalyst.h and for hydrogen in the range of 80–270 l/l catalyst.h, and the catalyst having a particle size of 1–5 mm and the palladium being contained therein in the outer thickness of 0.05–0.2 mm of the support, the catalyst having a total specific pore volume of 0.4–0.6 cm^3/g, a specific internal surface area of 130–160 m^2/g, having 40–60% of its pore volume in the form of pores having a diameter above 7.5 mm, and the palladium content of the catalyst being 0.1–0.6% by weight.

4,450,301
PROCESS FOR CONVERTING METHANOL TO FORMALDEHYDE

William P. McMillan; Charles C. Hobbs, Jr.; H. Robert Gerberich, all of Corpus Christi, Tex., and Michael L. Junker, Lake Charles, La., assignors to Celanese Corporation, New York, N.Y.

Filed Oct. 21, 1982, Ser. No. 435,848

Int. Cl.³ C07C *47/052*

U.S. Cl. 568—473 **5 Claims**

1. In a process for converting methanol to formaldehyde by (a) passing a gaseous first-stage feedstock mixture comprising methanol, water, and molecular oxygen at an elevated temperature of about 90° to 170° C. and substantially atmospheric pressure through a first bed of silver catalyst operating at about 550° to 700° C. to form a gasesous first-stage reaction product comprising formaldehyde and methanol; (b) cooling said first-stage reaction product to about 120° to 250° C.; and (c) passing a gaseous second-stage feedstock mixture comprising said cooled first-stage reaction product at an elevated temperature of about 120° to 250° C. through a second bed of silver catalyst operating at about 550° to 700° C., which bed comprises particulate silver, to form a gaseous second-stage reaction product, the improvement which comprises:

adjusting the composition of said gasesous second-stage feedstock mixture so as to maintain the molar ratio of formaldehyde to methanol therein within the range of about 0.9:1 to about 2.7:1 while also controlling the specific reaction rate of methanol in said second bed of silver catalyst within the range of about 10 to 60 grams of methanol converted per hour per square centimeter of cross-section of said second bed of silver catalyst.

4,450,302
PEROXIDE BLENDS

Chester R. Willis, East Marlborough Township, Chester County, Pa., assignor to Hercules Incorporated, Wilmington, Del.

Filed Aug. 9, 1982, Ser. No. 406,406

Int. Cl.³ C07C *179/06*

U.S. Cl. 502—150 **6 Claims**

1. As a new composition of matter, a peroxide blend having a melting point of about 5° C. and lower consisting essentially of:

(1) from about 40% to about 60% t-butyl cumyl peroxide;

(2) from about 5% to about 25% of a mixture of the meta and para isomers of bis(α-t-butylperoxyisopropyl) benzene, the mixture of meta and para isomers being in the proportion of between 1.5:1 to 4:1; and

(3) dicumyl peroxide in an amount sufficient to make the total of (1), (2) and (3) equal to 100%.

4,450,303
PROCESS FOR THE OXIDATION OF SECONDARY-ALKYL SUBSTITUTED BENZENES

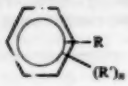
Charles A. Drake, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Feb. 23, 1983, Ser. No. 468,823

Int. Cl.³ C07C *179/02*

U.S. Cl. 568—574 **11 Claims**

1. A process for the production of a secondary alkyl substituted benzene hydroperoxide comprising heating a secondary alkyl substituted benzene of the formula



wherein R is a C_3 to C_{20} secondary alkyl, cycloalkyl, or secondary alkaryl radical, R' is a C_1 to C_{10} alkyl, aryl or alkaryl radical, and n is 0 to 5, in the presence of oxygen and from about 0.05 to 5 weight percent based on the weight of said said secondary-alkyl substituted benzene, of a samarium salt of the formula R''COOSm wherein R'' is a C_1 to C_{20} alkyl, aryl, alkaryl, or aralkyl radical, at a temperature of about 60° C. to 200° C.

4,450,304

POLYETHER DISPERSANTS

Helmut Diery, Kelkheim; Reinhold Deubel, Bad Soden am Taunus, and Joachim Weide, Kelkheim, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

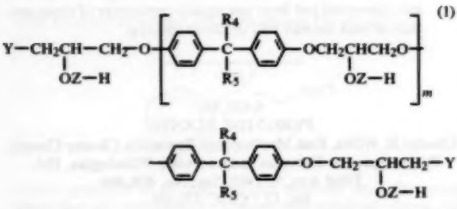
Filed Jul. 21, 1982, Ser. No. 400,274

Claims priority, application Fed. Rep. of Germany, Aug. 1, 1981, 3130609

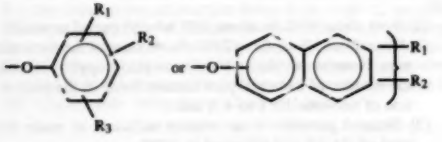
Int. Cl.³ C07C *43/205*

U.S. Cl. 568—609 **2 Claims**

1. A compound of the formula 1



in which Y denotes a group of the formulae



R_1, R_2, R_3 denote hydrogen, a C_1–C_{18}-alkyl radical, chlorine or bromine, R_4 and R_5 denote hydrogen or C_1–C_4-alkyl, m denotes 0 to 12 and Z denotes polyalkylene glycol radicals having a total of about 8 to about 200 ethylene glycol units —(CH_2—CH_2O)— or up to about 200 ethylene glycol units and alkylene glycol units of the formula

in which R_6 is methyl or ethyl and in which a total of at least 8 ethylene glycol units are present.

4,450,305

POLY(ETHYLENEOXY)-SUBSTITUTED-9,10-BIS(-PHENYLETHYNYL)ANTHRACENES

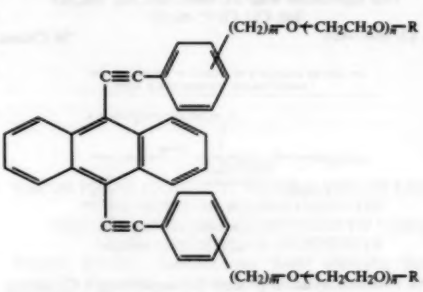
Victor M. Kamhi, Skillman, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Filed Oct. 25, 1982, Ser. No. 436,210

Int. Cl.³ C07C *43/166*

U.S. Cl. 568—611 **3 Claims**

1. A compound having the structural formula



wherein m is an integer from 1 to 5, n is an integer from 1 to 20, and R represents hydrogen, or C_1–C_5 alkyl.

4,450,306

SELECTIVE CATALYTIC ALKYLATION OF PHENOLS TO ALKYL ARYL ETHERS

Victoria Eskinazi, Cleveland Heights, Ohio, assignor to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Nov. 8, 1982, Ser. No. 440,133

Int. Cl.³ C07C *41/09*

U.S. Cl. 568—630 **17 Claims**

1. In a method for the alkylation of phenols by alcohols to yield alkyl aryl ethers, the improvement which comprises the use of $Sr(HSO_4)_2$ or $Ba(HSO_4)_2$ catalysts or mixtures thereof.

4,450,307

HYDROXY-CONTAINING BICYCLOALKANE ETHER COMPOUNDS

Philip H. Moss, and Edward C. Y. Nieh, both of Austin, Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Jun. 25, 1981, Ser. No. 277,425

Int. Cl.³ C07C *43/10, 43/11*

U.S. Cl. 568—665 **4 Claims**

1. A new compound comprising 5-(2-hydroxyethoxy) 2- and 3-alkyl norbornane.

2. A new compound comprising 5-(2-hydroxyethoxy) 2- and 3-octyl norbornane.

3. A new compound comprising 5-(2-hydroxyethoxy) 2- and 3-hexyl norbornane.

4. A new compound comprising 5-(2-hydroxyethoxy) 2- and 3-butyl norbornane.

4,450,308

PROCESS FOR THE PREPARATION OF TRIFLUOROMETHYLPHENYL OXYPHENYL ETHER COMPOUNDS

Heinz Forster, Wuppertal, and Uwe Priesnitz, Solingen, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

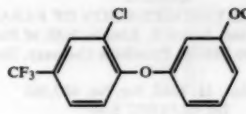
Continuation of Ser. No. 226,348, Jan. 19, 1981. This application Nov. 30, 1981, Ser. No. 325,809

Claims priority, application Fed. Rep. of Germany, Feb. 8, 1980, 3004695

Int. Cl.³ C07C *41/16*

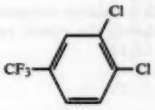
U.S. Cl. 568—637 2 Claims

1. Process for the preparation of (2-chloro-4-trifluoromethyl-phenyl)-(3-methoxy-phenyl)-ether of the formula



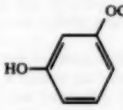
(I)

which process comprises reacting 1,2-di-chloro-4-trifluoromethylbenzene of the formula



(II)

in the presence of a diluent, selected from the group consisting of dimethylformamide, dimethylsulfoxide, toluene or xylene and at a temperature of between 90° and 100° C. with resorcinol monomethyl ether of the formula



(III)

and potassium hydroxide, or with a salt formed from resorcinol monomethyl ether of the formula (III) and potassium hydroxide, the respective molar ratios of formula (II) to formula (III) to potassium hydroxide being 1:1–1.5:1–2.

4,450,309

PROCESS FOR THE PREPARATION OF UNSATURATED GEMINAL DIHALOGEN COMPOUNDS

Rudolf Soós; József Nemes; László Vidra, , assignors to Chinoin Gyogyszer es Vegyeszeti Termekek Gyar Rt., Budapest, Hungary

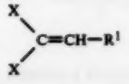
Filed Jun. 24, 1982, Ser. No. 391,866

Claims priority, application Hungary, Jul. 3, 1981, 1945/81

Int. Cl.³ C07C *17/33*

U.S. Cl. 570—217 7 Claims

1. A process for the preparation of a compound of the formula (I)

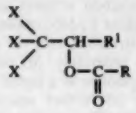


(I)

wherein

X is halogen,

R^1 is a straight or branched chain alkenyl group having 2 to 6 carbon atoms, which comprises reacting a compound of the formula (II)



(II)

wherein

X and R' have the same meaning as defined above, and

R is hydrogen, a straight or branched chain alkyl group having 1 to 6 carbon atoms or an optionally substituted aryl or aralkyl group, with 1 to 2 mol-equivalents of zinc, aluminum, tin, iron or magnesium and 0.01 to 1.5 mol.-equivalents of a mineral acid and/or acidic salt thereof, in a watermiscible organic solvent, at a temperature between 0° C. and 200° C.

4,450,310

CONVERSION OF METHANE TO OLEFINS AND HYDROGEN

Joseph R. Fox, Solon; Benedict S. Curatolo, Maple Heights, and Frederick A. Pesa, Aurora, all of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Filed Mar. 4, 1983, Ser. No. 471,970

Int. Cl.³ C07C *3/44*

U.S. Cl. 585—400 21 Claims

1. A process for the conversion of methane comprising contacting methane in the absence of oxygen and in the absence of water at a temperature of at least 500° C. with a catalyst comprising the mixed oxides of a first metal selected from lithium, sodium, potassium, rubidium, cesium and mixtures thereof and a second metal selected from beryllium, magnesium, calcium, strontium, barium and mixtures thereof.

4,450,311

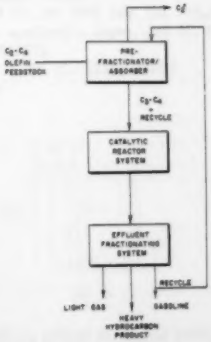
HEAT EXCHANGE TECHNIQUE FOR OLEFIN FRACTIONATION AND CATALYTIC CONVERSION SYSTEM

Bernard S. Wright, East Windsor; Hartley Owen, Belle Mead, and Chung H. Hsia, Matawan, all of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Jun. 29, 1983, Ser. No. 508,907

Int. Cl.³ C07C *2/00, 6/08*

U.S. Cl. 585—413 6 Claims



1. A continuous catalytic process for converting an olefinic feedstock comprising ethylene and C_3^+ olefins to heavier liquid hydrocarbon product comprising the steps of (a) prefractionating the olefinic feedstock to obtain a gaseous stream rich in ethylene and a liquid stream containing C_3^+ olefin; (b)

vaporizing and contacting the liquid stream from the prefractionating step with hydrocarbon conversion oligomerization catalyst in at least one exothermic catalytic reaction zone to provide a heavier hydrocarbon effluent stream comprising distillate, gasoline and lighter hydrocarbons; (c) cooling and fractionating the effluent stream to recover distillate, gasoline and lighter hydrocarbons separately; (d) recycling at least a portion of the recovered gasoline as a liquid sorbent stream to prefractionating step (a); (e) further reacting the recycled gasoline together with sorbed C_3^+ olefin in the catalytic reactor system of step (b); and (f) exchanging heat between hot effluent from said exothermic reaction zone and at least a portion of prefractionating liquid rich in C_3^+ olefin in a prefractionator reboiler loop.

4,450,312

HYDROCARBON CONVERSION

Ivan J. S. Lake, Middlesbrough, and Thomas V. Whittam, Darlinton, both of England, assignors to Imperial Chemical Industries PLC, London, England

Filed Dec. 17, 1981, Ser. No. 331,830

Claims priority, application United Kingdom, Dec. 17, 1980, 8040398

Int. Cl.³ C07C *5/24, 5/30*

U.S. Cl. 585—481 **10 Claims**

1. A process for isomerisation of an alkylbenzene or a mixture of alkylbenzenes, which method comprises contacting a feed of an alkylbenzene or a mixture of alkylbenzenes under isomerisation conditions in the vapor or liquid phase with a catalyst comprising zeolite Nu5 having a molar composition expressed by the formula:

$$0.5 \text{ to } 1.5\ R_2O{:}Y_2O_3{:}45 \text{ to } 100\ XO_2{:}0 \text{ to } 2000\ H_2O$$

wherein R is a monovalent cation or 1/n of a cation of valency n, X is silicon and/or gerdmanium, Y is either aluminum or aluminum and one or more of iron, chromium, arsenic, manganese and gallium, and H_2O is water of hydration additional to water notionally present when R is H, and having an X-ray diffraction pattern as set out in Table 1.

4,450,313

OXIDATIVE DEHYDROGENATION OF PARAFFINS

Alan D. Eastman, and James B. Kimble, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Apr. 21, 1983, Ser. No. 487,366

Int. Cl.³ C07C *5/00*

U.S. Cl. 585—624 **10 Claims**

1. A process for the catalytic oxidative dehydrogenation of a paraffin having from 2 to 5 carbon atoms comprising the step of contacting said paraffin under suitable oxidative dehydrogenation conditions with a catalyst composition comprising lithium and titanium, wherein the atomic ratio of lithium to titanium is above about 1.8:1.

4,450,314

THERMOCOUPLE FOR MEASURING TEMPERATURES AND METHOD OF MAKING THE THERMOCOUPLE

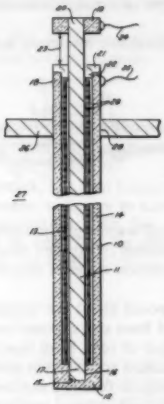
Werner Huther, Karlsfeld, Fed. Rep. of Germany, assignor to MTU Motoren-und Turbinen Union Munchen GmbH, Munich, Fed. Rep. of Germany

Filed Aug. 2, 1982, Ser. No. 404,014

Claims priority, application Fed. Rep. of Germany, Aug. 14, 1981, 3132237

Int. Cl.³ H01L *35/02*

U.S. Cl. 136—230 4 Claims



1. A method of making a thermocouple comprising the steps of providing a sinterable silicon carbide tube preform, the tube having a closed end and a blind hole in the closed end opening into the interior of the tube, inserting a carbon rod into the tube so that one end of the rod seats in the blind hole, and thereafter sintering the tube, the shrinkage of the tube material due to sintering causing it to tightly grip the rod end located within the blind hole.

4. A thermocouple for measuring temperatures, the thermocouple including a silicon carbide tube, a carbon rod within and along the whole tube, the rod and tube being radially spaced from each other, one end of the tube being closed, and one end of the rod engaging the interior of the closed tube end to form the hot junction of the thermocouple, the hot junction being within the tube, and a tube or powder of electrical insulating material within the space between the rod and tube, the thickness of the insulating tube being equal to or less than the radial spacing between the rod and tube.

4,450,315

THERMOCOUPLE ASSEMBLY

Roger S. Waterman, 20801 Higgins Ct., Palos Verdes, Calif. 90501

Filed Sep. 29, 1982, Ser. No. 426,818

Int. Cl.³ H01L *35/02*

U.S. Cl. 136—230 6 Claims

1. A process for forming a thermocouple apparatus, comprising the steps of

(a) providing a tubular, electrically conductive, casing constituting a probe and characterized by a distant closed end and a proximate open end, the interior of said casing enclosing a pair of thermocouple wires joined together to form a thermocouple junction located adjacent said closed end, the wires thence extending lengthwise, insulatingly spaced apart laterally, and having their respective ends projecting beyond said open end,

(b) providing a two-piece tubular transition fitting consisting of a body piece and a nose piece separable from said body piece, said pieces having cooperable coupling means, and the proximate end of said casing being lengthwise insertable for a short distance into said nose piece,

(c) inserting the proximate end of said casing including said projecting thermocouple wires extending therethrough into said nosepiece and forming a fixed union by brazing the casing to the nose piece,

(d) forming soldered unions between said projecting ends of the thermocouple wires and respective extension wires, adapted to transmit current developed at the thermocouple junction to a remote utilization device, and

(e) joining said transition fitting to said nose piece by said cooperable coupling means and inserting into the tubular fitting encapsulation material positioned to hold said soldered unions insulatingly spaced apart and sealed within the fitting.

4. A thermocouple apparatus comprising in combination:

a tubular electrically conductive casing constituting a probe and enclosing a pair of thermocouple wires joined together to form a thermocouple junction located adjacent a closed end of the probe, said wires extending lengthwise, insulatingly spaced apart and projecting from an open end of the casing,

a two piece transition fitting having cooperable coupling means carried by its two pieces, which pieces consist of a tubular body and a separable tubular nose piece, said casing and nose piece being joined together in a brazed union and said tubular body and nose piece being detachably connected and jointly forming a housing for a pair of soldered unions formed between the respective thermocouple wires and corresponding extension wires which latter extend out of the body, said tubular body containing encapsulation material which holds said wires and soldered unions insulatingly spaced apart and holds said two pieces together as a permanent union.

4,450,316

AMORPHOUS SILICON PHOTOVOLTAIC DEVICE HAVING TWO-LAYER TRANSPARENT ELECTRODE

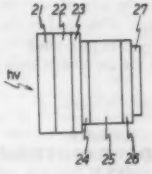
Yoshihiro Hamakawa, Kawanishi, and Yoshihisa Tawada, Kobe, both of Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Jul. 19, 1982, Ser. No. 399,312

Claims priority, application Japan, Jul. 17, 1981, 56-112571; Jul. 17, 1981, 56-112572

Int. Cl.³ H01L *31/06*

U.S. Cl. 136—256 4 Claims



1. In an amorphous silicon derivative PIN junction photovoltaic device, the improvement comprising a two layer transparent electrode consisting of ITO and SnO_2 layers that are provided on the P or N layer located on the light impinging side so that the SnO_2 layer is in contact with said P or N layer, said SnO_2 layer having a thickness of about 30 to about 500 angstroms.

4,450,317
HIGH VOLTAGE, GAS-FILLED ELECTRIC CABLE WITH SPACERS BETWEEN CONDUCTOR AND SHEATH

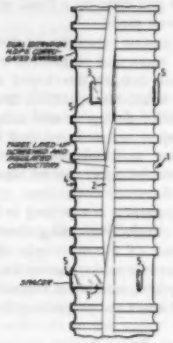
John A. Baskwell, Winchester, and Christopher Larrive, Southampton, both of England, assignors to Pirelli General Public Limited Company, London, England

Filed Feb. 4, 1982, Ser. No. 345,578

Claims priority, application United Kingdom, Feb. 13, 1981, 8104595

Int. Cl.³ H01B *9/06, 13/22;* **H02G** *1/00*

U.S. Cl. 174—27 **7 Claims**



1. An electric power cable for transmitting electric power, said cable comprising:

a plurality of separate, inner conductors which are twisted together;

an integrally formed, extruded plastic sheath surrounding said twisted conductors and having an internal diameter substantially greater than the overall external diameter of the twisted conductors whereby a void is defined around the twisted conductors within the sheath;

an insulating gas in said void around the twisted conductors;

a plurality of spacers supporting the plurality of twisted conductors within the plastic sheath at locations which are spaced apart from one another along the axis of the cable, each of said spacers being formed of solid dielectric material and having a number of generally radial webs engaged with the twisted conductors and extending into contact with the inner wall of said plastic sheath, each inner conductor being between a different pair of the generally radial webs;

said plastic sheath having a plurality of recesses at the inner wall thereof which correspond to and receive the outermost ends of the generally radial webs, each said recess having a wall which engages and at least partially surrounds the outermost end of the generally radial web received thereby and the wall of each recess complementing in shape the shape of the end of the generally radial web received thereby thus providing for reduction of the electrical stresses at the outermost ends of said generally radial webs.

4,450,318
MEANS AND METHOD FOR PROVIDING INSULATION SPLICE

Virgil R. Scardina, deceased, late of Norwood, Ohio, and by Annette Scardina, executrix, Milford, Ohio, assignors to Siemens-Allis, Inc., Atlanta, Ga.

Filed Sep. 29, 1981, Ser. No. 307,080

Int. Cl.³ H01R *4/70*

U.S. Cl. 174—84 R **12 Claims**

1. The method of forming a water-tight splice in the insulation of two electrical cables, comprising the steps of

securing the ends of the conductors of the cables together in electrically conductive relationship;

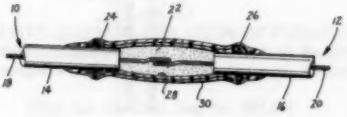
applying an insulative filler material having a putty-like consistency about the secured ends of the conductors;

disposing an O-ring about the insulation of each of said cables at points spaced from the secured ends of the conductors;

applying at least one layer of a flexible tape extending from the insulation of one cable to that of the other and covering said O-rings;

disposing a layer of shrinkable insulating material over said tape; and

causing said shrinkable insulating material to shrink.



10. An improved water-tight insulating joint for an insulated cable having a section of exposed conductor, comprising

a mass of insulation material disposed about said exposed conductor;

an O-ring disposed about the insulation of said cable at a point spaced from said exposed conductor;

at least one layer of resin-filled tape extending from a point on said insulation spaced from said O-ring, on the side of the O-ring remote from the exposed conductor, at least to a point about said exposed conductor; and

a layer of shrinkable polyester material extending over said resin-filled tape, said polyester material exerting a compressive stress on said tape and said O-ring.

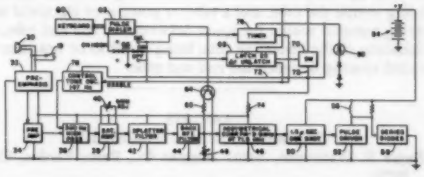
4,450,319
INFRARED TELEPHONE EXTENSION CONTROL SYSTEM

Robert E. Lucey, Sudbury, Mass., assignor to Controlonics Corporation, Westford, Mass.

Filed Jul. 31, 1981, Ser. No. 288,736

Int. Cl.³ H04B *9/00*

U.S. Cl. 179—2 EA **14 Claims**



1. A portable telephone network extension system comprising:

a portable unit for transmission and reception of audio and control signals comprising:

means for emitting infrared radiation positioned to emit in a pattern external to said unit;

means for receiving FM infrared radiation, said radiation containing control and audio information transmitted by a telephone network coupled means;

means for generating audible signals representative of said audio information;

means for generating dial pulses representative of a telephone number to be called;

means for generating an electrical signal in response to a user voice input;

means for providing FM pulse activation of said infrared

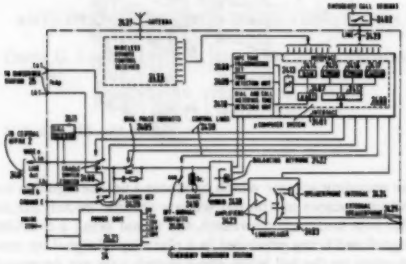
emitting means at pulse frequencies modulated in accordance with said electrical signal;
means for providing FM pulse activation of said infrared emitting means at an extreme pulse frequency coterminous with said dial pulses;
telephone network coupled means including:
means for receiving infrared emissions from said portable unit and for providing FM pulse demodulation thereof to recover said electrical signal;
means for applying said electrical signal to said telephone network;
means for receiving network signals from said telephone network; and
means for emitting FM infrared radiation modulated in accordance with said network signals.

4,450,320

DIALING DEVICE WITH CALLING NUMBER AND IDENTIFICATION MEMORY AND METHOD FOR USING SAME

Bernd Ostermann, Weissach, and Paul Lissner, Backnang, both of Fed. Rep. of Germany, assignors to Licentia Patent-Verwaltungs GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Oct. 26, 1981, Ser. No. 315,140
Int. Cl.³ H04M *11/04*
U.S. Cl. 179—5 R **11 Claims**



11. A dialing device for use at a calling station of a common dial network comprising a central office, a central station and a plurality of other calling stations, said calling stations being coupled to said central office by subscriber lines for automatic connection therebetween, wherein the dialing device comprises a memory for storing a calling number for said central station and a calling number and identification signal for said calling station in response to signals transmitted from said central station.

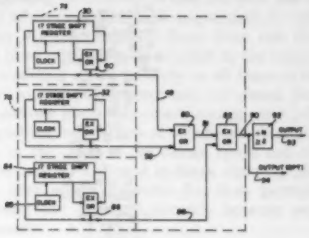
4,450,321

CIRCUIT FOR PRODUCING NOISE GENERATION FOR SOUND MASKING

William D. Quigley, 132 Oakridge Ave., Nutley, N.J. 07110, and Philip H. Nelson, 42 Harmony Rd., Spring Valley, N.Y. 10977

Filed Dec. 8, 1981, Ser. No. 328,787
Int. Cl.³ H04R *3/00*
U.S. Cl. 179—1.5 M **9 Claims**

1. Apparatus and circuit for generating audible masking noise which is a yield of a random bit stream with an indeterminate period to repeat its pattern, said noise producing apparatus including:
(a) at least two multi-stage shift registers, each with a first conducting means as an input to a first exclusive OR gate;
(b) an input signal carried from an intermediate shift from said multi-stage shift register and providing another input to said first exclusive OR gate;
(c) an asynchronous clock connected to each stage of said multi-stage register, said clock associated with each and only one multi-stage register and to feed pulse signals to each shift used in said register;
(d) output conducting means from said first exclusive OR gate with said output leading from said first exclusive OR gate to and as an input to the multi-stage shift register and from this same output feeding to a conducting means an output signal;



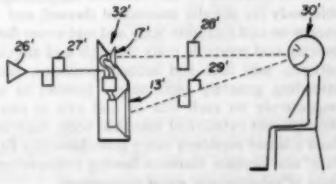
(e) a second exclusive OR gate which receives as inputs the output signals from the two first exclusive OR gates, and
(f) an output signal from this second exclusive OR gate as a random bit stream with an indeterminate period to repeat its pattern.

4,450,322

ADJUSTABLE SPEAKER SYSTEM AND METHOD OF ADJUSTMENT

David A. Wilson, 147 San Felipe Way, Novato, Calif. 94947

Filed Nov. 2, 1981, Ser. No. 317,053
Int. Cl.³ H04R *1/28, 1/02*
U.S. Cl. 179—146 E **12 Claims**

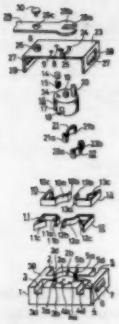


1. In a speaker assembly including a plurality of drivers, the improvement comprising mounting means for independently supporting the plurality of drivers, the mounting means for at least selected drivers of the plurality of drivers including means for independently adjusting the respective selected drivers relative to a critical listening point in a listening environment in order to establish increased sound coherency for the plurality of drivers at the critical listening point of the listening environment by establishing a desired time or phase alignment for the drivers, the adjustment means including calibration means allowing repeatable alignment of drivers within the system relative either to each other or to one or more critical listening points within a listening environment in order to establish a desired time or phase alignment, and which means facilitates the interchange of drivers within the speaker system while maintaining said desired time or phase relationship.

4,450,323
REVERSIBLE SWITCH

Takeshi Iitsuka, Katsuta, Japan, assignor to Hitachi Koki Company, Limited, Tokyo, Japan

Filed Nov. 24, 1981, Ser. No. 324,578
Int. Cl.³ H01H 9/00, 19/38
U.S. Cl. 200—1 V 16 Claims



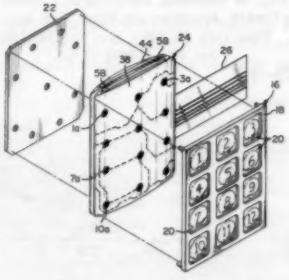
1. A reversible switch comprising:
(a) a base;
(b) four fixed contact members mounted on said base and having arcuate contacts, respectively, spaced angularly from each other and jointly defining an interrupted circular wall;
(c) a substantially cylindrical rotatable body fitted in said circular wall for angular movement about its own axis, said cylindrical body having a pair of grooves;
(d) a pair of movable contact members resiliently accommodated in said grooves respectively, and each having contact ends slidable into contact respectively with adjacent two of said fixed contact members, said rotatable body being angularly movable through an angular interval between a first position in which each movable contact member electrically connects a pair of said adjacent fixed contact members and a second position in which each movable contact member electrically connects another pair of said adjacent fixed contact members;
(e) a cover mounted on said base and supporting said rotatable body for angular movement thereof; and
(f) means on said rotatable body and said cover for angularly moving said rotatable body through said angular interval between said first and second positions, said grooves extending generaly rectilinearly parallel to each other respectively on each side of said axis at one axial end through said cylindrical rotatable body, each of said four fixed contact members being non-elastically fitted in said base, said arcuate contacts having concave contact surfaces of substantially equal dimensions.

4,450,324
ENCODED KEYBOARD SWITCH

Kazutoyo Fukukura, Reading, and Richard A. Martinez, Stoneham, both of Mass., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Jun. 8, 1983, Ser. No. 502,369
Int. Cl.³ H01H 13/70
U.S. Cl. 200—5 A 5 Claims

1. An encoded keyboard switch of the type comprising a single sheet of flexible insulating material which has been folded along fold lines to produce a stack of four sections of film in parallel aligned relationship, the stack comprising a first section, a second section, a third section, and a fourth section, the first and second sections having opposed surfaces on which there are provided a plurality of first switch sites, the third and fourth sections having opposed surfaces on which there are provided a plurality of second switch sites, each first switch site being in alignment with a second switch site, first switch electrodes on the opposed surfaces of the first and second sections at first switch sites, second switch electrodes on the opposed surfaces of the third and fourth sections at second switch sites, a common ground conductor and a plurality of signal bit conductors on the opposed surfaces, selected conductors extending across the folds of the single sheet, and a tail extending from the sheet, the signal bit conductors and the ground conductor extending onto the tail, the switch assembly being characterized in that:
selected first switch sites and selected second switch sites are electrically isolated from the signal bit conductors and from the common ground conductor,
selected second switch electrodes on the second section are two pole electrodes and all switch electrodes on the first, third and fourth sections are single pole electrodes,
all second switch electrodes on the third section and selected first switch electrodes on the first section are connected to the common ground conductor, and
the routing of the signal bit conductors is in accordance with



an encoding scheme which produces a unique signal in the bit conductors on the tail when a specific switch site on the first section is depressed, the signal being a multi-bit signal and being produced in a plurality of signal bit conductors on the tail when some switch sites are depressed and being a single bit signal and being produced in a single signal bit conductor on the tail when other switch sites are depressed whereby, upon depression of the first section at a location above a predetermined first switch site, the opposed surfaces of the predetermined first switch site will be moved into contact with each other, and thereafter the opposed surfaces of the second switch site which is beneath the predetermined first switch site will be moved into contact with each other, and a unique signal will be produced by a circuit extending from the ground conductor on the tail through signal bit conductors to at least one signal bit conductor on the tail, and when the unique signal is a multi-bit signal, the circuit will not be completed by the ground conductor until all of the switch electrodes required for the production of the multi-bit signal have been electrically connected to each other.

4,450,325
ELECTRO-MECHANICAL HAND CONTROLLER

Tom R. Luque, 22000 Romar St., Chatsworth, Calif. 91311

Continuation of Ser. No. 275,595, Oct. 8, 1981, abandoned. This application Apr. 6, 1983, Ser. No. 480,777
Int. Cl.³ H01H 25/00, 29/00, 35/00, 9/00
U.S. Cl. 200—52 R 10 Claims

1. An inclination sensitive control handle, comprising:
a generally cylindrical handle controllable by an operator by tilting of said handle from a preselected position, said handle being at least slightly compressible radially inwardly in response to manual squeezing thereof;
a plurality of tilt switches mounted within said handle, each

of said tilt switches being oriented for actuation or deactuation upon tilting of said handle away from said preselected position; and

a squeeze responsive control switch in a nonexposed position within said handle for controllably connecting and disconnecting supply of electrical power to said tilt switches in response to squeezing of said handle.

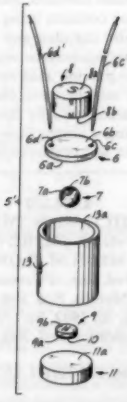
2. The inclination sensitive control handle of claim 1 further including a finger-depressible switch mounted generally at one end of said handle.

4,450,326

ANTI-THEFT VIBRATION DETECTOR SWITCH AND SYSTEM

Curtis G. Ledger, 1-A New Walnut St., North Plainfield, N.J. 07060

Filed Oct. 19, 1981, Ser. No. 312,690
Int. Cl.³ H01H *35/02*
U.S. Cl. 200—61.45 M **9 Claims**



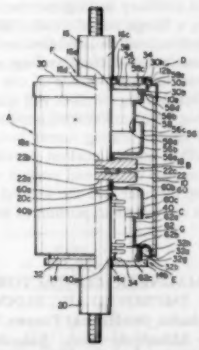
1. A vibration detection switch comprising in combination: a circuit board having a series of alternately occuring negative and positive electrical contacts arranged in a substantially circular arrangement, a ball having an electrically conductive surface of a size such that when resting between any two consecutive ones of said negative and positive electrical contacts, the ball contacts and completes electrical circuit between the two consecutive electrical contacts, said ball being of a material conductive of magnetic flux such that the ball is magnetically responsive to lines of magnetic flux of a magnet, confining means for preventing the ball from rolling off said series on said board, a magnet having first pole thereof extending substantially transversely of said board substantially centrally of said circular arrangement such that said ball is magnetically attracted and held in contact with said two consecutive ones of said negative and positive contacts, and said confining means being positioned to substantially circumscribe said series and said ball when the ball is magnetically held by said first pole, and a magnet having a second pole of a magnetic-pole charge identical to that of the first pole, the second pole being positioned extending substantially transversely of said board substantially centrally of said circular arrangement in a position of opposing relationship to said first pole and spaced from said ball when said ball is held magnetically by said first pole such that like-pole magnetic fluxes from said first and second poles cause said ball to be repelled by the second pole toward said confining means whereby at all times of rest the ball is forced to maintain contact and completed electrical circuit with said two electrical contacts except when jolted by a vibration resulting from a blow at which time there is movement of one or the other of the circuit board and the ball relative to one another sufficient to break electrical circuitry momentarily after which magnetic flux lines promptly reestablish contact and electrical circuitry between said two electrical contacts.

4,450,327

VACUUM INTERRUPTER

Hifumi Yanagisawa, Sagamihara; Junichi Warabi, Shizuoka, and Yoshiyuki Kashiwagi, Tokyo, all of Japan, assignors to Kabushiki Kaisha Meidensha, Tokyo, Japan

Filed Jul. 16, 1981, Ser. No. 283,866
Claims priority, application Japan, Jul. 21, 1980, 55-99693
Int. Cl.³ H01H *33/00*
U.S. Cl. 200—144 B **17 Claims**



1. A vacuum interrupter comprising in combination:

an envelope including a cylindrical housing made of stainless steel and having a first end portion and a second end portion, a disc-shaped upper end plate made of ceramic insulating material having an aperture in the center portion thereof and a disc-shaped lower end plate made of a ceramic insulating material having an aperture in the center portion thereof;

an electrical contact member including a stationary contact rod inserted into said envelope through said aperture of the upper end plate, a stationary electrical contact secured to said stationary contact rod, a movable contact rod inserted into said envelope through said aperture of the lower end plate and a movable electrical contact secured to said movable contact rod;

shielding means for shielding an inner surface of said envelope;

first sealing means including a first auxiliary sealing member made of a plastically deformable metallic material which is deformable by the thermal stress generated during a cooling process after brazing and a metallized portion provided between said first auxiliary sealing member and said upper end plate and for sealing hermetically the upper

end plate to said first end portion of said housing by plastically deforming said first auxiliary sealing member after brazing the first sealing member to said housing;

second sealing means including a second auxiliary sealing member made of a plastically deformable metallic material which is deformable by the thermal stress generated during a cooling process after brazing and a metallized portion provided between said second auxiliary sealing member and said lower end plate and for sealing hermetically said lower end plate to said second end portion of said housing by plastically deforming said second auxiliary sealing member after brazing the second sealing member to said lower end plate and said housing;

first supporting means including a third auxiliary sealing member made of a plastically deformable metallic material which is deformable by the thermal stress generated during a cooling process after brazing and a metallized portion provided between said upper end plate and said third auxiliary sealing member and for supporting and securing hermetically said stationary contact rod to said upper end plate by plastically deforming said third auxiliary sealing member after brazing the third sealing member to said upper end plate and said stationary contact rod;

said first, second and third auxiliary sealing members having different coefficients of thermal expansion from those of said upper and lower end plates;

hermetic seal means for sealing movably and hermetically said movable contact rod to said lower end plate including a bellows for securing said movable contact rod to said lower end plate and a metallized portion provided between said lower end plate and said bellows; and

stress absorbing means for absorbing thermal stress and mechanical stress and provided in at least one of said first and second auxiliary sealing members, each sealing member having a flange portion and a tubular portion and at least one curved portion, said first sealing means having at least one surface-to-surface sealing portion provided between a vacuum side surface of one end portion of said first auxiliary sealing member and the first end portion of said housing or an outer end portion of said upper end plate, said second sealing means having at least one surface-to-surface sealing portion provided between a vacuum side surface of one end portion of said second auxiliary sealing member and the second end portion of said housing or an outer end portion of said lower end plate.

4,450,328

ELECTROMAGNETIC CONTACTOR MEANS WITH IMPROVED ARC RUNNER

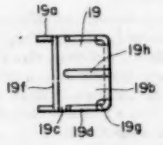
Shizutaka Nishizako, and Hiroaki Tazawa, both of Aichi, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 14, 1981, Ser. No. 301,866

Claims priority, application Japan, Sep. 19, 1980, 55-133200[U]

Int. Cl.³ H01H *33/10*

U.S. Cl. 200—144 R **8 Claims**



1. In an electromagnetic contactor of the type having first and second contacts which engage and disengage in response to electromagnetic controls and which create an arc between said contacts upon disengaging, and an arc runner having a driving part comprising a back plate facing said contacts and side plates on opposite sides of said contacts and having an overhanging plate above said contacts, the improvement comprising:

stopper means on said overhanging plate adapted to engage said side plates for preventing said overhanging plate from bending toward the inside of said arc runner, said overhanging plate and back plate having first and second arc lead parts, respectively, said first arc lead part of said overhanging plate being disposed at an end thereof above said contact and being bent outwards above an intermediate portion of said side plate.

4,450,329

GAS CIRCUIT BREAKER

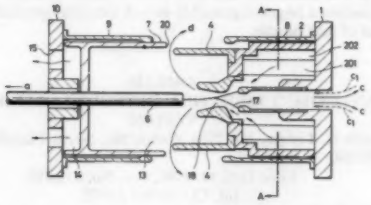
Satomi Arimoto; Shigeru Yamaji, and Chikato Ishitobi, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed May 14, 1982, Ser. No. 378,355

Claims priority, application Japan, May 19, 1981, 56-73119[U]

Int. Cl.³ H01H *33/88*

U.S. Cl. 200—148 A **5 Claims**



1. A gas circuit breaker, comprising;

fixed and movable main contacts, and fixed and movable arc contacts, said main contacts being opened before said arc contacts, a pressure chamber and a chamber of negative pressure, and a passageway between the said two chambers openable by moving said movable arc contact, an inside surface of said pressure chamber being provided with axially extending radially inwardly directed projections for preventing a vortex flow in said pressure chamber when a fluid in said pressure chamber is made to flow.

4,450,330

ELECTRIC SWITCH WITH TWO QUENCHING NOZZLES HAVING AN IMPROVED QUENCHING MEDIUM FLOW

Karl Zückler, Berlin, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Aug. 20, 1982, Ser. No. 410,064

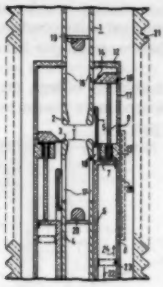
Claims priority, application Fed. Rep. of Germany, Aug. 27, 1981, 3134200

Int. Cl.³ H01H *33/70*

U.S. Cl. 200—148 A **6 Claims**

1. In an electric switch including: two quenching nozzles arranged opposite each other to form a switching gap distance, across which an arc is generated during switching, one of which is mounted at a stationary contact tube and the other at a stationary guide tube; a longitudinally movable switching tube for bridging the switching gap; a pressure piston/pressure cylinder arrangement, including a movable pressure piston, for generating a quenching medium flow acting on the arc; and a common drive to which the switching tube and the movable pressure piston of the pressure piston/pressure cylinder arrangement are coupled, the improvement comprising: the pressure cylinder being a stationary pressure cylinder one end of which surrounds the contact tube, the pressure piston being rigidly connected to the switching tube and disposed in said stationary pressure cylinder; passage openings in the contact

tube connecting the pressure cylinder in the region of its end surrounding the contact tube, to the interior of the contact tube; a suction cylinder having one end facing the pressure cylinder, a suction piston in said suction cylinder, the pressure



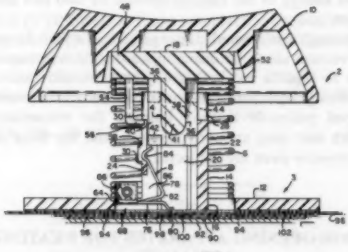
piston being connected rigidly to said suction piston, said suction cylinder being stationary and surrounding the guide tube; and holes in said guide tube connecting said suction cylinder, in the region of its end facing the pressure cylinder, to the interior thereof.

4,450,331

KEY SWITCH ASSEMBLY HAVING MOMENTARY CLOSED INTERVAL

Kazutoyo Fukukura, Reading, Mass., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Jun. 8, 1983, Ser. No. 502,368
Int. Cl.³ H01H *13/52*
U.S. Cl. 200—160 **9 Claims**



1. A key switch assembly of the type comprising a panel-like support, a pair of spaced-apart switch contacts on the support at a switch site, a frame on the support proximate to the switch site, the frame comprising a column extending normally of the support and having a fixed end and a free end, a plunger on the column which is normally maintained in an extended position relative to the support by a biasing spring, the plunger being movable towards the support to a depressed position, and a switch closing lever pivotally mounted on the frame which is movable in response to movement of the plunger and which is effective electrically to connect the switch contacts to each other, the key switch assembly being characterized in that:

the switch closing lever is a bell crank having a pivotal axis, a switch closing arm, and a cam follower arm, the pivotal axis being adjacent to the switch site and extending parallel to the plane of the panel-like support, the switch closing arm extending from the pivotal axis towards the switch site and having a free end which is proximate to, but normally spaced from, the switch contacts, the camming arm extending from the pivotal axis beside the plunger and having a free end which is spaced from the pivotal axis, the camming arm having a cam follower portion,

the plunger having a stiffly flexible camming rod extending from the upper end thereof towards the inner end, the camming rod having a camming portion which is angularly spaced from the cam follower portion of the camming arm, relative to the axis of the plunger, and which moves past the cam follower portion during movement of the plunger to the depressed position, and

a cam deflector on the frame proximate to the cam follower portion of the camming arm, the cam deflector having a deflecting surface which is engaged by the camming portion of the camming rod when the plunger is moved to the depressed position, the deflecting surface causing flexing of the camming rod laterally towards the cam follower portion of the camming arm with resulting engagement of the cam follower portion by the camming portion of the camming rod and arcuate movement of the bell crank whereby the free end of the switch closing arm is moved towards the switch contacts and causes closing of the switch,

the deflecting surface being of limited extent whereby the camming rod returns to its normal position when the camming portion moves past the deflecting portion with resulting movement of the free end of the switch closing arm away from the switch contacts and opening of the switch whereby

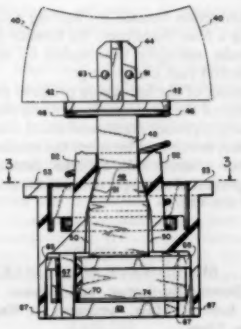
the switch contacts are electrically connected to each other only during a beief interval during movement of the plunger from the extended position to the depressed position.

4,450,332

KEYSWITCH DESIGN

Russell D. Stamm, and Manfred J. Wullschleger, both of El Paso, Tex., assignors to General Instrument Corporation, New York, N.Y.

Filed Aug. 25, 1982, Ser. No. 411,435
Int. Cl.³ H01H *3/12*
U.S. Cl. 200—340 **10 Claims**



1. In a keyswitch comprising a housing, a plunger which is spring-loaded into a first position within said housing, a channel in said housing through which said plunger can slide from said first position to a second position, a keytop attached to one end of said plunger, and a switch actuator coupled to the other end of said plunger, the improvement comprising:

a shaft portion on said plunger which is tapered at an angle of approximately 16°; and

a frustrum shaped interior portion in said channel which extends substantially along the length of said tapered shaft portion and mates therewith when said plunger is in said first position;

whereby the mating of said frustrum shaped interior portion and said tapered shaft portion aligns the plunger in the housing

and minimizes the lateral movement thereof to prevent the plunger from rattling when in said first position.

8. In a keyswitch comprising a housing, a plunger which is spring-loaded into a first position within said housing, a channel in said housing through which said plunger can slide from said first position to a second position, a key top attached to one end of said plunger, and a switch actuator coupled to the other end of said plunger, the improvement comprising:

a plurality of tapered ribs on said plunger; and

a plurality of tapered grooves in said channel adapted to mate with said tapered ribs when said plunger is in said first position;

wherein said ribs are tapered at an angle of approximately 16°.

4,450,333

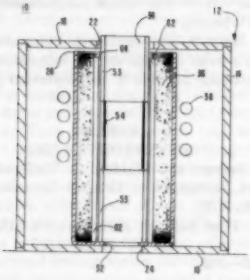
ZIRCONIA INDUCTION FURNACE

Matthew J. Andrejco, North Hanover Township, Burlington County; Un C. Paek, West Windsor Township, Mercer County, and Charles M. Schroeder, Jr., North Hanover Township, Burlington County, all of N.J., assignors to AT&T Technologies, Inc., New York, N.Y.

Filed May 28, 1982, Ser. No. 383,386

Int. Cl.³ H05B *6/30*; C03B *27/02*; F27B *14/10*

U.S. Cl. 219—10.49 R **6 Claims**



1. In an induction furnace for heating a lightguide preform and drawing a fiber therefrom, the furnace having a centrally located tubular susceptor surrounded by an insulating grain and an induction coil, comprising:

a thin coating of the lightguide preform material on at least a portion of the inside surface of the susceptor; and

an insulating cylinder positioned about and spaced from the susceptor, interposed between the insulating grain and the susceptor wherein said cylinder substantially eliminates the migration of small particles of the grain to the preform and/or the fiber.

4,450,334

MICROWAVE PIZZA MAKER

Robert F. Bowen, Burlington, and Thomas J. Martel, North Reading, both of Mass., assignors to Raytheon Company, Lexington, Mass.

Filed Apr. 24, 1981, Ser. No. 256,889

Int. Cl.³ H05B *6/80*

U.S. Cl. 219—10.55 E **6 Claims**

1. A utensil for heating pizza in a microwave oven, comprising:

a horizontal annular base having a plurality of spaced slots around the peripheral region of said annular base, said base being made of a first microwave transparent material;

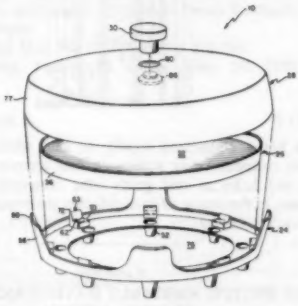
support pedestals inserted into said slots, the top of each of said pedestals having a substantially horizontal inward surface and a raised outer member, said pedestals being made of a second microwave transparent material which is a higher temperature material than said first microwave transparent material;

a metallic pan having a substantially flat bottom with a raised side, sid pan being removably supported in fixed horizontal alignment by said horizontal inward surfaces of said pedestals;

a layer comprising ferrite particles bonded to the underside of said bottom and directly facing the floor of said microwave oven for producing heat by absorption of microwave energy, said heat being conducted through said pan to heat pizza therein, said layer being spaced from said pedestals;

said base having a plurality of legs, the downward ends of said legs being spaced more than an inch from said removably supported pan;

a metallic cover removably supported by said base, said



cover having a peripheral region overlapping said raised side for a distance of greater than 0.25 inches in a direction perpendicular to the edge of said side, said region being spaced and substantially parallel to said side for forming a partial microwave choke to limit the amount of microwave energy in the interior defined by said pan and said cover; and

the opening of said annular base providing a path for natural convection air to be drawn inwardly from between said legs to replace air heated adjacent to said microwave absorbing layer and convected outwardly between said spaced pedestals thereby limiting the temperature to which said base, support pedestals, and the floor of said microwave oven are subjected.

4,450,335

DOOR OPENING APPARATUS FOR HEATING APPLIANCE

Toshiki Shimizu, and Kazuyuki Inoue, both of Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Jan. 29, 1982, Ser. No. 343,733

Claims priority, application Japan, Feb. 2, 1981, 56-14798

Int. Cl.³ H05B *9/06*

U.S. Cl. 219—10.55 C **7 Claims**

6. A door opening apparatus for a heating appliance comprising:

a housing having a heating cavity therein, said heating cavity having an opening;

a door supported on said housing for selectively opening and closing said heating cavity;

at least one locking member disposed in the door;

at least one engaging member disposed in the housing to be engaged with said locking member to lock the door in its closed position;

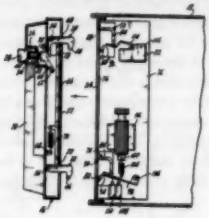
at least one releasing member for releasing the engagement of said locking member and engaging member to unlock the door;

a plunger solenoid for moving said releasing member;

a power supply circuit to supply a power voltage to said plunger solenoid;

a foot switch disposed outside of the housing and connected to said power supply circuit to supply said power voltage in response to the operation of said switch;

at least one safety switch disposed proximate said releasing member for stopping the heating operation of said appliance when the door is opened, said releasing member being spaced from said safety switch when the door is in the open position so that the heating operation of the



appliance is prevented and being brought in contact with the safety switch to change the condition of the switch when the door is closed so that the heating operation of the appliance can be initiated;

at least one stop switch for stopping the operation of the plunger solenoid when the door is opened; and

at least one spring for coupling said plunger solenoid and said releasing member,

whereby once the door is opened by the operation of the plunger solenoid, the solenoid and the appliance are rendered inoperative.

4,450,336

SUPER-FINE FINISH EDM METHOD AND APPARATUS

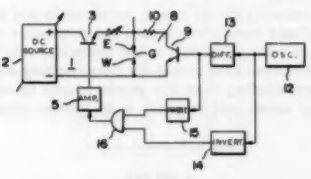
Kiyoshi Inoue, Tokyo, Japan, assignor to Inoue-Japax Research Incorporated, Yokohama, Japan

Filed Jul. 29, 1981, Ser. No. 288,054

Claims priority, application Japan, Aug. 5, 1980, 55-107395

Int. Cl.³ B23P 1/08

U.S. Cl. 219—69 M **30 Claims**



1. A method of electrical-discharge-machining an electrically conductive workpiece wherein a tool electrode is spacedly juxtaposed with the workpiece to define a machining gap therewith filled with a dielectric liquid, which method comprises:

effecting a succession of localized, time-spaced and repetitive machining electrical discharges between said tool electrode and said workpiece across said machining gap to produce stock removal from said workpiece over the surface thereof juxtaposed with said tool electrode; and

improving the surface finish of said stock-removed surface of the workpiece by discharging electrical charge stored due to a stray capacitance across said tool electrode and said workpiece during each time interval between the successive machining electrical discharges, through an electrical shunt circuit in parallel with said machining gap immediately prior to initiation of each of said machining electrical discharges across said machining gap.

4,450,337

EDM METHOD AND APPARATUS WITH A CONTINUOUS DC SUPPLY USING STRAY GAP CAPACITANCE TO TRIGGER DISCHARGE

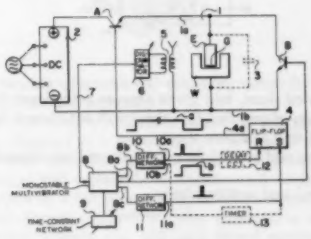
Kiyoshi Inoue, Tokyo, Japan, assignor to Inoue-Japax Research Incorporated, Yokohama, Japan

Filed Mar. 16, 1982, Ser. No. 358,875

Claims priority, application Japan, Mar. 20, 1981, 56-40768

Int. Cl.³ B23P 1/08

U.S. Cl. 219—69 M **17 Claims**



1. A method of machining a workpiece by effecting successive electrical discharges between a tool electrode and the workpiece across a dielectric-filled machining gap, comprising the steps of:

(a) connecting a first switch in a series circuit between a DC source and said machining gap, having a stray capacitance distributed therein;

(b) connecting a second switch across said machining gap in parallel with said DC source;

(c) turning said first switch on to apply a DC output directly to said machining gap and to permit said stray capacitance to repetitively charge and discharge the charge thereon, thereby producing a succession of successive, discrete electrical discharges through said machining gap between the tool electrode and the workpieces;

(d) sensing the magnitude of high-frequency signals contained in said successive electrical discharges and, upon the sensed magnitude falling below a predetermined threshold level, issuing a gap-shunting signal;

(e) in response to said gap-shunting signal, turning said second switch on and thereby short-circuiting said machining gap to terminate said successive electrical discharges while permitting said first switch to be turned off; and

(f), subsequent to step (e), establishing a time interval in which said machining gap is free from current flow from said DC source and repeating steps (c), (d) and (e) in sequence to progressively machine said workpiece.

4,450,338

METHOD OF FABRICATING A TRUSS CORE SANDWICH PANEL

Charles E. Conn, Jr., Riverside, Calif., assignor to TRE Corporation, Beverly Hills, Calif.

Filed May 4, 1982, Ser. No. 374,766

Int. Cl.³ B23K 11/00, 11/06

U.S. Cl. 219—78.12 **14 Claims**

1. A method of fabricating a truss core sandwich panel of the type including first and second face sheets secured on opposite sides of a corrugated sheet, comprising the steps of:

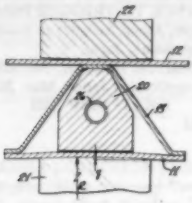
(a) welding said first face sheet to one side of said corrugated sheet;

(b) positioning said second face sheet in contact with the other side of said corrugated sheet;

(c) positioning a conductive mandrel between said first face

sheet and said corrugated sheet, the height of said mandrel being less than the distance between said first face sheet and said corrugated sheet by a given amount;

(d) applying a force to said first and second face sheets to deflect said first face sheet so that opposite sides of said mandrel are in contact with said first face sheet and said



corrugated sheet, said given amount being such that said deflection of said first face sheet will not exceed the yield point of said first face sheet;

(e) welding said second face sheet to said corrugated sheet; and

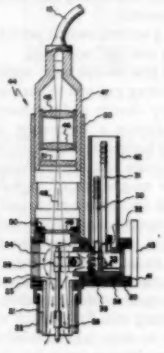
(f) releasing said welding force.

4,450,339

WELDING TORCH WITH VISION ATTACHMENT

Nelson R. Corby, Jr., Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Jul. 26, 1982, Ser. No. 401,473
Int. Cl.³ B23K 9/10
U.S. Cl. 219—124.34 **8 Claims**



1. An improved gas tungsten arc welding torch with an integral vision sensor comprising:

a housing which supports a gas cup and an integral optical vision system having an optical axis that passes through said gas cup;

a metal torch body in said housing which has cover gas, electrical power, and coolant connections and an integral slim profile electrode holder in the form of a projecting arm for securing a tungsten electrode approximately on the optical axis and in said gas cup, said torch in operation establishing an electric arc between said electrode and the workpiece;

said optical vision system being directly above said electrode and holder and providing on the face of a fiber optic bundle an image of the workpiece weld puddle and weld area with said holder out of focus and not evident; and

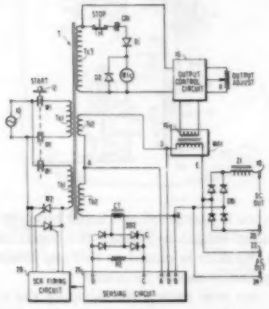
a blocking device on said electrode having a cross section tailored to shield the arc from being imaged and eliminate image distortions caused by the presence of the bright arc and any artifacts.

4,450,340

ARC WELDER POWER SUPPLY WITH FAIL-SAFE VOLTAGE REDUCING CIRCUIT

Don J. Corrigall, and Marvin L. Schiedermayer, both of Appleton, Wis., assignors to Miller Electric Manufacturing Company, Appleton, Wis.

Filed Dec. 10, 1982, Ser. No. 448,866
Int. Cl.³ B23K 9/10
U.S. Cl. 219—132 **6 Claims**



1. In an arc welding power supply of the type including transformer means having its primary side connectable to an A.C. power source and having its secondary side connected across output terminals connectable to a welding electrode and a work piece, respectively, the improvement:

wherein the primary side of said transformer means comprises first and second primary windings connected in parallel, and the secondary side of said transformer means comprises first and second secondary windings connected in series, so that full open circuit voltage is applied across said output terminals when both primary windings are connected to the power source, and so that a standby voltage lower than the full open circuit voltage is applied across said output terminals when only one of said primary windings is connected to the power source; and comprising

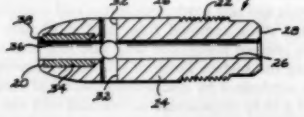
voltage-reducing circuit means, connected in said secondary side of said transformer means and responsive to the absence of welding current in said secondary side for a first predetermined time period, for disconnecting said second primary winding from the power source to reduce the voltage across said terminals to said lower standby voltage.

4,450,341

CONTACT TIP FOR A WELDING HEAD

Earl T. Dietrick, Euclid, and Timothy F. Prayner, Mentor, both of Ohio, assignors to Townmotor Corporation, Mentor, Ohio

Filed Nov. 30, 1981, Ser. No. 340,585
Int. Cl.³ B23K 9/00
U.S. Cl. 219—137.52 **6 Claims**



1. A contact tip for a welding head comprising:

a body formed of a first material and having an external surface, an electrode receiving end, an electrode discharge end, and a longitudinal passageway extending between said ends and having a construction sufficient for physically and electrically contacting a wire electrode of a predetermined diameter substantially along the entire length of said passageway and for directing the wire electrode while it passes through said longitudinal passageway;

as single wear-resistant member formed of a different second material and having a first end, a spaced second end, and an inner passageway extending between said first end and said second end, said passageway having a diameter substantially equal to the predetermined diameter of said electrode, said wear resistant member being mounted in said body with its first end disposed adjacent the electrode discharge end of said body, and the inner passageway of said member being aligned with the longitudinal passageway of said body; and

at least one transverse passageway in said body adjacent only the second end of said wear resistant member for communicating said longitudinal passageway with said external surface of the body.

4,450,342

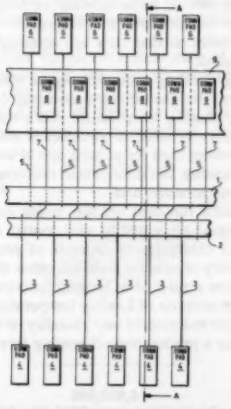
THERMAL PRINT HEAD

Willie Goff, Jr., Austin; James M. Rakes, Leander, and Errol R. Williams, Round Rock, all of Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 27, 1982, Ser. No. 452,994

Int. Cl.³ H05B *3/00*; G01D *15/10*; B41J *3/20*

U.S. Cl. 219—216 **7 Claims**



5. A thermal print head comprising an electrically insulating substrate carrying a first row of equally spaced connector pads, a first row of connector leads extending in parallel from the first row of connector pads to a position at which they underlie, and connect to, a first electrically resistive, continuous, print bar longitudinally extending normal to the first row of connector leads, a second row of equally spaced connector leads extending in parallel from a second row of connector pads to a position at which they underlie, and connect to, a second electrically resistive, continuous, print bar longitudinally extending normal to the second row of connectors and in parallel with the first print bar, and a third row of equally spaced connector leads extending in parallel from a third row of connector pads and normal to the print bars to a position at which they underlie, and connect to, the first print bar, each lead in the third row including an extension which underlies and is connected to, the second print bar.

4,450,343

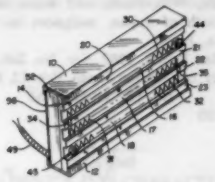
HIGH OUTPUT, LONG DURATION, QUICK RESPONSE, RADIANT ELECTRICAL HEATER

Gerard M. Dundon, 1353 Valley Rd., Apt. B, Wayne, N.J. 07470

Filed Oct. 19, 1981, Ser. No. 312,230

Int. Cl.³ H05B *3/26*

U.S. Cl. 219—357 **5 Claims**



1. A heating apparatus and mounting means for electrically energized heaters, including:

(a) a continuous wire form in which the energized elements are disposed in a generally flat and planar array and in secured condition are disposed in a plane, said wire formed into a plurality of lengths, each length wound or formed in a flat planar array and in a serpentine pattern with sloped adjacent portions disposed in substantially straight extents and with said sloped portions having a turned end portion with and including a determined radius to accommodate the wire size and convolution, each length and said serpentine pattern having the wire arranged in an accordion shaped array and with each length having at least one end disposed to provide a substantially transverse portion and connection to an adjoining and adjacent length;

(b) a support member having an electrical insulating capability with a high "R" value as a heat insulating member, said support member having the capability to retain and support electrical resistance wires when heated by current passing therethrough at and to temperatures up to thirty-two hundred degrees Fahrenheit;

(c) a plurality of substantially parallel and planar grooves formed in the outer face of the support member, each groove having a width and length sufficient to accept and freely retain the lengths of wire and having a formed depth sufficient to retain the wire below the outer surface of the support when and while the wire is mounted therein, said lengths disposed to be mounted against and to the base of the support member in said grooves, the area between grooves providing insulating ribs adapted to prevent unwanted and potential shorting of adjacent lengths of wire;

(d) a crossover groove formed in the face of said support member and adapted to accept the transverse portion of wire extending between lengths;

(e) a multiplicity of metal retaining means for engaging the wire at a selected spacing and pattern, each metal retaining means adapted to locally secure a sloped portion of a wire intermediate the end of a straight extent and to retain this serpentine patterned wire in a planar groove and against the support member so that changes of length of the wire because of heating and cooling does not cause dislocation of the retained wire in the groove and the length of wire so retained does not change as to its radiant energized heating capability, each of said retaining means carried by and secured to the support member;

(f) a metal frame adapted to retain the support member without approaching or encroaching upon the lengths of wire to increase or decrease their energizing capability;

(g) an electrical insulating member disposed to the rear of the apparatus and opposite the face of the support member, said insulating member adapted to prevent shorting and/or contact with the metal supporting means, and

(h) insulated electrical conducting means disposed to engage

the unconnected ends of the wire and provide means for conducting electrical energy from an external source to said wire form.

4,450,344

DAMPER DRIVE SYSTEM IN A COMBINED MICROWAVE AND ELECTRIC HEATER OVEN

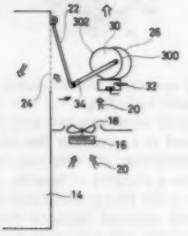
Yasuhiro Sakoda, Wakayama, and Kazuyuki Matsubayashi, Amagasaki, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Feb. 8, 1982, Ser. No. 346,535

Claims priority, application Japan, Feb. 12, 1981, 56-18812[U]

Int. Cl.³ H05B *6/68*

U.S. Cl. 219—400 **8 Claims**



1. A cooking apparatus comprising:

an oven cavity defined by an oven wall, said oven wall having an aperture formed therein;

fan means for creating a forced air flow along an outer surface of said oven wall in such a manner that a portion of said forced air flow is introduced into said oven cavity through said aperture;

damper means for selectively closing said aperture formed in said oven wall for precluding the introduction of said forced air flow into said oven cavity; and

a damper drive system for selectively placing said damper means in a closed condition and an open state, said damper drive system including:

a damper motor having a drive shaft; means for rotating said drive shaft of said damper motor;

transfer means for transferring the rotation of said drive shaft of said damper motor to said damper means;

switch means operatively connected to said transfer means for selectively being turned off and on;

detection means for sensing a voltage indicative of said switch means being in said on position and developing a first detection signal when said damper means is in the closed condition, and for sensing a voltage indicative of said switch means being in said off position and developing a second detection signal when said damper means is in the open state; and

a motor drive unit for terminating the rotation of said drive shaft of said damper motor when said first detection signal or said second detection signal is developed.

4,450,345

FOODSTUFFS HEATING APPARATUS WITH SELECTIVE HEATING FUNCTIONS

Kouichi Hotta, Yachiyo; Yukichi Yazawa, Kashiwa, and Osami Tatsukawa, Matsudo, all of Japan, assignors to Hitachi Heating Appliances Co., Ltd., Chiba, Japan

Filed Apr. 22, 1981, Ser. No. 256,619

Claims priority, application Japan, May 12, 1980, 55-62494; May 12, 1980, 55-62495

Int. Cl.³ H05B *1/02*

U.S. Cl. 219—491 **10 Claims**

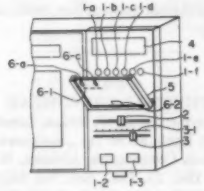
1. A foodstuffs heating apparatus wherein a plurality of different heating function modes are selectively effected and heating temperature and heating time are settable, comprising:

a plurality of selector switches provided corresponding to said plurality of different heating function modes and each adapted to be actuated to select a corresponding one of the heating function modes, for causing said apparatus to operate in the selected heating function mode;

cooking cards prepared in one to one correspondence relationship with various different foodstuffs to be heated in said apparatus;

card holder means for removably holding a selected one of said cooking cards, in use;

through holes formed in each of said cooking cards at portions thereof so that when the selected cooking card is located in said card holder means, predetermined ones of said plurality of selector switches which are not required to be selectively actuated in connection with the object of cooking represented by the cooking card oppose said through holes so that said predetermined selector switches



cannot be actuated by the selected cooking card, while the remaining one or more selector switches which are required to be selectively actuated do not oppose the through holes so that they are actuated by the selected cooking card;

means for generating a control signal when the foodstuffs represented by the selected cooking card requires the setting of heating temperature and a specified switch of said plurality of selector switches is actuated by the selected cooking card for at least one of selecting and operating a heating function mode requiring the setting of heating temperature; and

selector switch function change means responsive to said control signal generated by said control signal generating means, for changing the function of preselected ones of said plurality of selector switches other than said specified switch from a purpose of heating function mode selection to another purpose of heating temperature setting so that said preselected ones of said plurality of selector switches thereby set a predetermined heating termperature.

4,450,346

ELECTRIC HEATER PLATE

Premakaran T. Boaz, Livonia, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed May 14, 1981, Ser. No. 263,637

Int. Cl.³ H05B *3/06*

U.S. Cl. 219—522 **6 Claims**

1. An electric heater plate comprising:

a base material of electrically nonconductive material having at least a first surface to which metallic materials may be bonded;

a plurality of thin lines of a nonprecious metal which acts as a resistor when electrical energy flows therethrough, said plurality of thin lines being bonded to said first surface of said base material and extending from a first location on said first surface to a second location on said first surface;

at least two interconnection areas of a nonprecious metal which acts as a resistor when electrical energy flows therethrough, said interconnection areas being bonded to

said first surface of said base material, one of said interconnection areas physically and electrically interconnecting said plurality of thin lines at said first location on said first surface and a second of said interconnection areas physically and electrically interconnecting said plurality of thin lines at said second location on said first surface;

a terminal area of silver ceramic material associated with each of said interconnection areas, each of said terminal

areas having both a first portion thereof overlying and physically and electrically bonded to an associated interconnection area and a second portion thereof overlying and bonded to said first surface of said base material and not in contact with said associated interconnection area; and

an electrical lead bonded to each of said terminal areas for making electrical connection to said plurality of thin lines.

4,450,347

HEATING BODY

Guy Courvoisier, and Simon Arieh, both of Geneva, Switzerland, assignors to Battelle Memorial Institute, Carouge, Switzerland

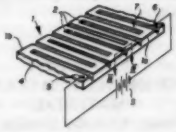
PCT No. PCT/CH81/00125, 371 Date Jun. 24, 1982, 102(e) Date Jun. 24, 1982, PCT Pub. No. WO82/01799, PCT Pub. Date May 27, 1982

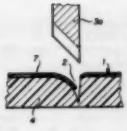
PCT Filed Nov. 10, 1981, Ser. No. 395,018

Claims priority, application Switzerland, Nov. 12, 1980, 8385/80

Int. Cl.³ H05B *3/34*

U.S. Cl. 219—549 **4 Claims**





1. A heating body comprising a metal sheet attached by at least one of its faces to a surface of an insulating support and having parallel slots extending alternately from two opposite edges of this sheet and terminating at a distance from the edge opposite to that from which they start in order to form a resistive conductor over the entire surface of the sheet, designed to be connected to a current source at opposite ends, these slots being provided by punching and being spaced from one another by deformation of the portion of the conductor adjacent to at least one of the said edges of these slots into the surface of the support, said slots passing through the said support only, at the most, over a portion of their length in order to laterally connect the parallel portions of the said conductor mechanically to one another at both ends of each slot while providing electrical interconnection of adjacent parallel portions only at one end of each slot.

4,450,348

METHOD AND DEVICE FOR CHARACTERIZING AND IDENTIFYING FALSIFICATION PROOF DATA BOARDS

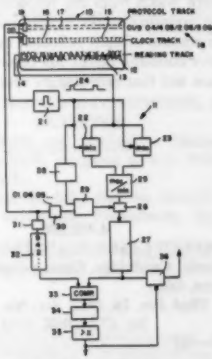
Hermann Stockburger, Kirnachweg 7, D-7742 St. Georgen, and Hans-Georg Winderlich, Niedere Str. 36, D-7730 Villingen, both of Fed. Rep. of Germany

Continuation of Ser. No. 221,547, Dec. 31, 1980, abandoned. This application Sep. 3, 1982, Ser. No. 414,645

Claims priority, application Fed. Rep. of Germany, Jan. 9, 1980, 3000560

Int. Cl.³ G06K *5/00*

U.S. Cl. 235—380 **4 Claims**



1. A system for authenticating and updating a data support, providing protection against falsification, imitation, or duplication thereof, the data support comprising an area with a random uncoded pattern to be read, data storage means having prerecorded data stored therein corresponding to measurement data representative of a physical property of said area to be read, and a correspondence track having means to indicate which portions of the area are to be measured when the data support is compared with the prerecorded data in said data storage means, said system comprising first means for measuring a physical property of the data support, second means for comparing said measured physical property with the prerecorded data corresponding to the physical property of said data support to determine if the data support is authentic, and third means for recording in said data storage means the measured physical property in place of the prerecorded physical property stored by said data storage means in the event said data support is recognized as authentic, whereby if in sequental use of the data support the measured physical property is related to the previous recorded physical property within acceptable limits, the updating of the measured property will allow the further use of an authentic data support as the authentic data support ages.

4,450,349
BAR CODE WITH OPTICAL READING DEVICE

Siegfried Apitz, Pforzheim, and Rolf Nonnenmann, Karlsbad, both of Fed. Rep. of Germany, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Mar. 5, 1982, Ser. No. 355,017
Claims priority, application Fed. Rep. of Germany, Mar. 11, 1981, 310928
Int. Cl.³ G06K 7/10
U.S. Cl. 235—462 12 Claims

1. Bar code readable with an optical reading device comprising

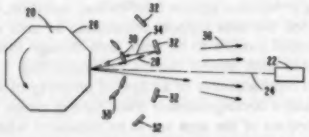
a plurality of characters each formed by a certain sequence of code bars and intervening spaces separating said code bars from one another, the widths of the spaces between the code bars and the widths of the code bars amounting to at least one predetermined modular pattern width; and

means for optically subdividing those of said spaces whose widths amount to at least twice said modular pattern width into separate spaces, including counting marks interposed in said spaces at a spacing of at least one modular pattern width from the respective neighboring code bar, said counting marks having such optical properties that the amount of light reflected during scanning of the respective counting marks lies between that reflected by said space and that reflected by said code bar.

4,450,350
LOW SPEED LASER SCANNING APPARATUS

James A. Hardy, Cambridge, Ohio, assignor to NCR Corporation, Dayton, Ohio

Filed Jun. 28, 1982, Ser. No. 392,448
Int. Cl.³ G06K 7/10
U.S. Cl. 235—467 18 Claims



1. A system for scanning coded indicia comprising:

means for providing a beam of radiant energy;

a rotating scanning means having a first reflective surface located in the optical path of said beam for reflecting said beam along a first predetermined path;

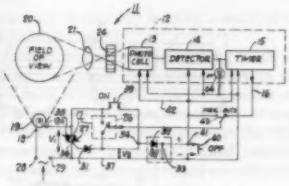
first optical means orientated at an angle to said first reflective surface and located in said first predetermined path for reflecting the beam towards said reflective surface which reflects the beam along a second predetermined path;

and means located in said second predetermined path for directing the reflected beam onto a scan area in the form of a multi-line intersecting scan pattern through which passes the coded indicia to be scanned.

4,450,351
MOTION DISCONTINUANCE DETECTION SYSTEM AND METHOD

Jacob Fraden, Hamden, Conn., assignor to Bio/Optical Sensor Partners, Ltd., Oberlin, Ohio

Continuation of Ser. No. 249,068, Mar. 30, 1981. This application Feb. 24, 1983, Ser. No. 469,467
Int. Cl.³ H05B 39/04
U.S. Cl. 250—221 23 Claims



13. A motion detection system, comprising, in combination:

an electrical circuit having a detector connected to the output of photosensitive means;

imaging means to establish illumination on said photosensitive means from a given field of view;

alternating condition image distortion means included in one of said imaging means and said photosensitive means to establish nonuniform electrical output of said photosensitive means upon motion of objects in said given field of view;

a housing for said electrical circuit;

shield means in said housing establishing at least a part of said given field of view and shielding said photosensitive means from direct illumination from electrical illuminating means of said field of view;

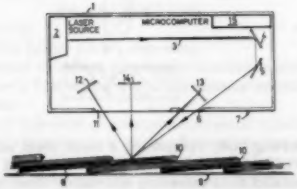
timer means connected to the output of said detector adapted to maintain energization of the terminals of the illuminating means upon motion of objects in said given field of view and de-energization of the terminals of the illumination means upon passage of a given time period subsequent to discontinuance of motion of objects in said given field of view; and

electrical means including an amplifier having an output change responsive to the initial change of illumination upon de-energization of the terminals of the illumination means to establish continued de-energization of said illumination means terminals.

4,450,352
METHOD AND DEVICE FOR COUNTING SHEET MATERIAL

Christer H. K. Olsson, Enskede, Sweden, assignor to Dagens Nyheters AB, Gothenburg, Sweden

Continuation of Ser. No. 269,759, Jun. 2, 1981, abandoned. This application Oct. 5, 1983, Ser. No. 538,839
Claims priority, application Sweden, Jun. 4, 1980, 8004165
Int. Cl.³ G06M 7/06
U.S. Cl. 250—223 R 2 Claims



1. Apparatus for counting overlapping objects such as newspapers, printed matter and the like, comprising means for

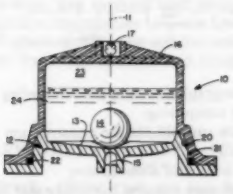
advancing the objects in a single plane in a series with their overlapping edges facing all in the same direction, means for directing an exact parallel light laser beam obliquely against the objects in a direction opposite said facing direction of the overlapping edges at an acute angle to said plane and to an imaginary line which is perpendicular to said plane, at least two measuring cells for detecting the light of the laser beam that is reflected from the objects, one said cell being positioned to receive light that is reflected along one line that is inclined at an acute angle to said plane on the opposite side of said imaginary line from said beam, another of said cells being positioned to receive light that is reflected along another line that is disposed between said one line and said laser beam, whereby the overlapping edge of each object, upon reaching the vicinity of said one line, will produce a diminution of the quantity of light reflected along said one line relative to the quantity of light reflected along said another line, and means for counting said diminutions as a measure of the number of said objects whose overlapping edges pass through said beam.

4,450,353

TILT DETECTOR WITH PYRAMIDAL SURFACE

John R. Sjolund, Arden Hills, Minn., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Sep. 8, 1981, Ser. No. 299,910
Int. Cl.³ G01D *5/34*; G01C *9/06*
U.S. Cl. 250—231 R **7 Claims**



1. A tilt detecting device adapted for use in an application where greater tilt can be tolerated in one direction than in another direction and including a light source, a light responsive device, a spherical opaque body, and means supporting said body for rolling movement transverse to an axis extending between said source and said device in response to tilting of said housing away from a position in which said body is on said axis and occludes said light responsive device from said source, said supporting means comprising a concave basin generally symmetrical about said axis and having a bottom configured as the surfaces of planes intersecting along lines passing through a common point on said axis in which a first pair of said lines defines a first plane and a second pair of said lines defines a second plane perpendicular to said first plane and wherein said second pair of said lines intersects said axis at angles greater than the angles at which said first pair of said lines intersects said axis.

4,450,354

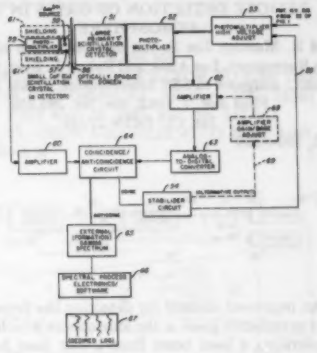
GAIN STABILIZED NATURAL GAMMA RAY DETECTION OF CASING THICKNESS IN A BOREHOLE

Harry D. Smith, Jr., and Carl A. Robbins, both of Houston, Tex., assignors to Halliburton Company, Duncan, Okla.

Continuation-in-part of Ser. No. 395,517, Jul. 6, 1982. This application Apr. 8, 1983, Ser. No. 483,400
Int. Cl.³ G01V *5/00*; G01T *1/20*
U.S. Cl. 250—256 **24 Claims**

1. A method of gamma ray spectral logging of a well borehole to determine the casing thickness of a cased well borehole, substantially independently of borehole conditions, comprising the steps of:

(a) measuring by detection in a gain stabilized energy responsive detection system in a logging tool the energy spectrum of gamma rays from outside a casing in the vicinity of a well borehole said gamma ray spectrum being divided into gamma ray intensities measured in two energy bands and wherein said gain stabilization is accomplished by use of a reference gamma ray energy emitter which coincidently emits a charged particle, and



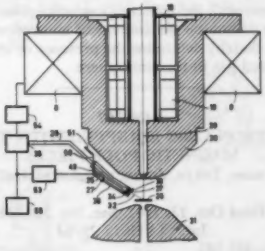
(b) combining the gamma ray count rate data in one energy band in which photoelectric absorption in iron is significant with the gamma ray count rate data in one energy band where photoelectric absorption in iron is not significant to form an output signal indicative of casing thickness.

4,450,355

ELECTRON MICROSCOPE COMPRISING AN X-RAY DETECTOR

Hendricus C. J. Mariën, and Michael N. Thompson, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 26, 1981, Ser. No. 314,936
Claims priority, application Netherlands, Jan. 30, 1981, 8100449
Int. Cl.³ G01N *23/225*; H01J *37/256*
U.S. Cl. 250—310 **7 Claims**



1. An electron microscope comprising:

at least one electromagnetic lens controlling an electron beam,

an object receiving said electron beam and producing radiation,

detector means adjacent to said object for measuring said radiation from said object,

an electron absorbing shield movable into position between said object and said detector means, and

means for moving said shield into and out of said position in accordance with energization of said electromagnetic lens, said shield being moved into said position at low

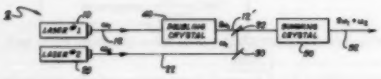
energization of said electromagnetic lens and being moved out of said position at high energization of said electromagnetic lens.

4,450,356

FREQUENCY-MIXED CO_2 LASER RADAR FOR REMOTE DETECTION OF GASES IN THE ATMOSPHERE

Edward R. Murray; Jan E. van der Laan, both of Palo Alto; Arne Rosengreen, Los Altos, and Robert L. Byer, Stanford, all of Calif., assignors to SRI International, Menlo Park, Calif.

Filed Jun. 7, 1982, Ser. No. 385,490
Int. Cl.³ G01N *21/39*
U.S. Cl. 250—339 **10 Claims**



10. An improved method for detecting the presence of one or more preselected gases in the atmosphere which comprises:

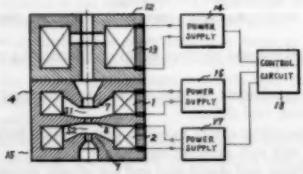
a. generating a laser beam from a first laser beam source having a frequency in the infrared spectrum;
b. doubling the frequency of said laser beam;
c. generating a laser beam from a second laser beam source having a frequency in the infrared spectrum;
d. adding the doubled frequency from one of said laser beams to the frequency of the other laser beam to obtain a laser beam at a third frequency;
e. tuning at least one of said laser beams so that the third frequency produced by doubling one of the beam frequencies and adding it to the other frequency is a preselected frequency highly absorbed by said preselected gas;
f. transmitting said highly absorbable third frequency laser beam through the atmosphere toward a reflecting target;
g. detecting the reflected beam;
h. retuning at least one of said lasers so that the resultant third frequency laser beam is not highly absorbed by said preselected gas;
i. transmitting said resultant low absorption third frequency laser beam toward the same target;
j. detecting the reflected signal from said low absorption laser beam; and
k. comparing the strength of the reflected highly absorbable laser beam with the reflected low absorption second laser beam to determine the amount of absorption of said first beam to thereby determine the presence or absence of said preselected gas in the atmosphere.

4,450,357

ELECTRON LENS EQUIPPED WITH THREE MAGNETIC POLE PIECES

Katsushige Tsuno, Tokyo, Japan, assignor to Jeol Ltd., Tokyo, Japan

Filed Oct. 13, 1981, Ser. No. 310,735
Int. Cl.³ H01J *29/64*
U.S. Cl. 250—356 ML **6 Claims**



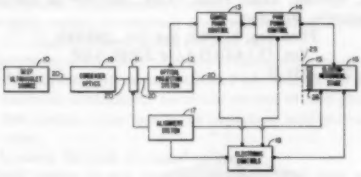
1. An electron lens in which three adjacent magnetic pole pieces define two gaps therebetween for generating two magnetic fields of opposite polarities therein at high magnification above about several tens of thousands times, characterized in that the magnetomotive forces of the magnetic fields in the two gaps are selected to be different, said magnetomotive force of the magnetic field in the upper gap being set at a value close to the magnetomotive force providing a minimum focal length under the condition that the magnetomotive forces in both gaps are equal to each other, and said magnetomotive force of the magnetic field in the lower gap being set larger than that of the magnetic field in the upper gap whereby radial and spiral distortions are minimized and the focal length is shortened.

4,450,358

OPTICAL LITHOGRAPHIC SYSTEM

George O. Reynolds, Waban, Mass., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Sep. 22, 1982, Ser. No. 421,623
Int. Cl.³ H01L *21/76*; B23K *9/00*
U.S. Cl. 250—492.1 **18 Claims**



1. An optical lithographic system for fabricating small linewidths, said system comprising:

A. a first substrate suitable for the construction of an integrated circuit;
B. an ultraviolet source of illumination;
C. an optical condenser coupled to receive said illumination from said ultraviolet source;
D. a mask including a desired pattern of lines to be exposed on said first substrate;
E. an ultraviolet sensitive photoresist layer on said first substrate whose sensitivity is substantially matched to that of said ultraviolet source of illumination;
F. an optical imaging system for imaging a reduced representation of said mask onto said photoresist layer; and
G. means for focusing said reduced representation of said mask produced by said optical system onto said photoresist layer to within a depth of focus, P, where:

$$P = \pm k \cdot L(2f/d)^2$$

where L is the operating wavelength of said source of illumination, f is the focal length of said optical imaging system, d is the diameter of said optical imaging system, and k is a constant.

4,450,359

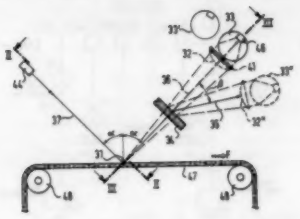
FAULT DETECTION APPARATUS FOR MATERIAL WEBS

Dieter Röss, Planegg, and Klaus Ostertag, Munich, both of Fed. Rep. of Germany, assignors to Erwin Sick GmbH Optik-Elektronik, Waldkirch, Fed. Rep. of Germany

Filed Feb. 18, 1981, Ser. No. 235,694
Claims priority, application Fed. Rep. of Germany, Feb. 19, 1980, 3006072
Int. Cl.³ G01N *21/88*
U.S. Cl. 250—572 **48 Claims**

1. Fault detection apparatus for material webs comprising a light transmitting device for directing light onto the surface of a web along a line to effect line-wise scanning thereof, said web having a width; an elongate light receiving device extending

parallel to said line and spaced therefrom to receive light scattered from said web in a reception plane defined by said line and said elongate light device, said elongate light receiving device extending over at least said width of said web and having first and second ends, and also a continuous elongate light inlet surface extending over the width of said web and acting to transmit light incident on said light inlet surface to one of said first and second ends; a photoelectric detector means associated with said elongate light receiving device and positioned to receive light from said one end, for generating an



electrical signal from the light received by said light receiving device; an elongate angular range filter disposed between said line of light and said elongate light receiving device; wherein said elongate angular range filter extends over at least said width of said web parallel to said line and to said elongate light receiving device, and wherein said elongate angular range filter if adapted to discriminate between first and second ranges of angles of light beams leaving said line and to allow only light lying in said first range to reach said elongate light receiving device.

4,450,360

ALKYLARYLIODONIUM SALTS AND METHOD FOR MAKING

James V. Crivello, Clifton Park, and Julia L. Lee, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Mar. 12, 1982, Ser. No. 357,435

The portion of the term of this patent subsequent to Aug. 16, 2000, has been disclaimed.

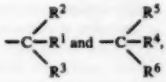
Int. Cl.³ C07F 9/66

U.S. Cl. 260—440 **10 Claims**

1. Arylalkyliodonium salts having the formula,

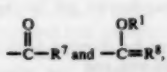
$$[R\text{-}I\text{-}Y]^{+}MF_d^{-}$$

where R is a $C_{(6-13)}$ aryl radical, Y is a monovalent aliphatic or cycloaliphatic group selected from



R^1 and R^4 are selected from hydrogen and $C_{(1-8)}$ alkyl radical R^2 and R^3 are

or a mixture of



where R^7 and R^8 are selected from $C_{(1-13)}$ organic radicals which together can form a $C_{(6-13)}$ aromatic radical, $C_{(5-13)}$ heterocyclic radical, or two $C_{(6-13)}$ aryl radicals, a mixture of $C_{(1-8)}$ alkyl and $C_{(6-13)}$ aryl, and a mixture of alkyl and oxyalkyl or alkyl and oxyaryl, and R^5 and R^6 are monovalent electron withdrawing groups selected from nitrile and a mixture of nitro and $C_{(6-13)}$ aryl M is a metal or metalloid selected from antimony, arsenic, phosphorus and boron, and d is an integer equal to from 4–6 inclusive.

4,450,361

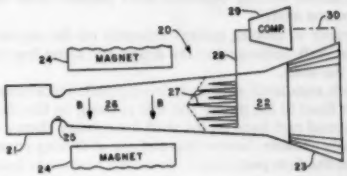
COUPLING OF MHD GENERATOR TO GAS TURBINE

James F. Holt, 3795 Osborn Rd., Medway, Ohio 45341

Filed Aug. 26, 1982, Ser. No. 411,947

Int. Cl.³ H02N 4/02; H02K 45/00; F02K 5/00

U.S. Cl. 290—1 R **5 Claims**



1. An improved power plant comprising:

a. means providing a source of high temperature gaseous flow;

b. a rotary turbine driven by said gaseous flow;

c. means defining a duct for conducting said gaseous flow from said source to said turbine;

d. a magnetohydrodynamic generator adjacent said duct and intermediate said source and said turbine, said generator interacting with said gaseous flow to generate electrical power; and

e. a plurality of cooling fins disposed within said duct intermediate said generator and said turbine for cooling said gaseous flow.

4,450,362

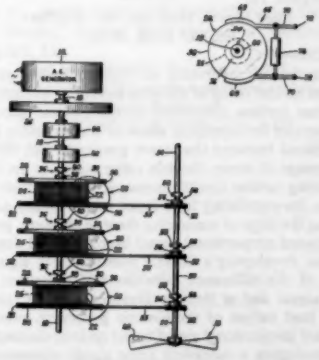
WIND ENERGY APPARATUS

Paul H. Gallagher, 2530 Crawford Ave., Evanston, Ill. 60201

Filed Feb. 17, 1982, Ser. No. 349,202

Int. Cl.³ F03D 9/00; F03G 3/00

U.S. Cl. 290—55 **1 Claim**



1. Energy generating apparatus comprising,

a load to be driven including a rotary member,

a horizontal first common shaft,

means operably connecting the first common shaft to the rotary member of the load,

a plurality of weights,

a plurality of drums individual to the weights, mounted on the first common shaft and free running thereon,

a cable secured to each weight and connected to the corresponding drum and capable of being wound on the drum, each drum including a pair of end plates forming flanges, a first of the flanges having a groove and constituting a driven pulley, and the second flange constituting a rotary braking member,

a clutch associated with each drum including a first part fixed to the drum and free running on the shaft and a second part fixed on the shaft for rotation therewith and axially slidable thereon into and out of driving connection with the first part,

a horizontal second common shaft parallel with the first common shaft,

a plurality of driving pulleys mounted on the second common shaft, individual to the drums and being free running on the shaft,

a clutch associated with each driving pulley including a first part fixed to the pulley and free running on the shaft, and a second part fixed on the shaft for rotation therewith and axially slidable thereon into and out of driving connection with the first part,

drive belts interconnecting the respective driving pulleys and driven pulleys,

brake means operably associated with each rotary braking member,

a windmill for driving the second common shaft,

the foregoing members being operable for enabling selectively and individually clutching the driving pulleys on the second common shaft for driving the respective drums and thereby winding up the corresponding cables thereon and lift the corresponding weights, and enabling selectively and individually clutching the drums to the first common shaft for rotating the latter and driving the load,

brake means operative for holding the first common shaft and thus the load stationary against the tendency of the weights to drive them, and

means operable for regulating the speed of rotation of the first common shaft and thus the load.

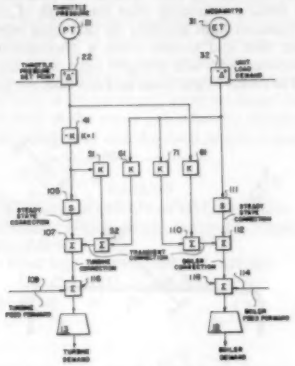
4,450,363

COORDINATED CONTROL TECHNIQUE AND ARRANGEMENT FOR STEAM POWER GENERATING SYSTEM

Thomas D. Russell, Montville, and Robert R. Walker, Euclid, both of Ohio, assignors to The Babcock & Wilcox Company, New Orleans, La.

Filed May 7, 1982, Ser. No. 375,798
Int. Cl.³ F01K *13/02*
U.S. Cl. 290—40 C **3 Claims**

1. A method of operating an electric power generation system, the system being of the type having an electric generator, a steam turbine connected to the electric generator, a steam generator for supplying steam to the turbine, a flow line interconnected between the steam generator and the turbine for the passage of steam, throttle valve means in the flow line for regulating turbine throttle pressure, and fuel flow regulating means for regulating heat input to the steam generator, comprising the steps of measuring throttle pressure, producing a feed-forward proportional signal based on load demand for the turbine, developing a throttle pressure error signal representative of the difference between said measured throttle pressure signal and a throttle pressure setpoint, measuring electrical load output of the electric generator, producing a feedforward proportional signal based on load demand for the boiler, developing a megawatt error signal representative of the difference between said measuring electrical output signal and a unit load demand, and further comprising, during transient operation, combining said throttle pressure error signal and said megawatt error signal to produce (1) a first combined signal corresponding to the difference of said megawatt error signal and said throttle pressure error signal, and biasing the throttle valve controls by means responsive to said first combined signal, and (2) a second combined signal corresponding to the sum of said megawatt error signal and said throttle pressure error signal, and biasing the fuel flow control by means responsive to said second combined signal.

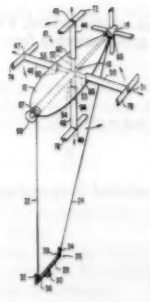


4,450,364

LIGHTER THAN AIR WIND ENERGY CONVERSION SYSTEM UTILIZING A ROTATING ENVELOPE

William R. Benoit, 336 Pleasant St., Laconia, N.H. 03246

Filed Mar. 24, 1982, Ser. No. 361,176
Int. Cl.³ F03D *9/00, 1/04*
U.S. Cl. 290—55 **24 Claims**



1. A buoyant device comprising:

an envelope filled with a lighter-than-air gas having an longitudinal axis;

means connected to said envelope for allowing wind-rotation of said envelope about said axis; and

means supported by said envelope for generating electricity in response to rotation of said envelope.

4,450,365

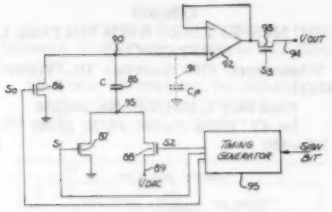
DIGITAL LOGIC BUFFER FOR CONVERTING SINGLE POLARITY ANALOG SIGNALS TO DUAL POLARITY ANALOG SIGNALS

Marcian E. Hoff, Jr.; Marshall A. Townsend, and Stephen F. Dreyer, all of Sunnyvale, Calif., assignors to Intel Corporation, Santa Clara, Calif.

Division of Ser. No. 120,701, Feb. 11, 1980, which is a continuation-in-part of Ser. No. 85,247, Oct. 16, 1979, abandoned, which is a continuation of Ser. No. 927,029, Jul. 24, 1978, abandoned. This application Sep. 14, 1981, Ser. No. 302,318

Int. Cl.³ H03K 17/66, 5/156

U.S. Cl. 307—262 2 Claims



1. A buffer for converting a first signal having a single polarity to a second signal having a dual polarity, comprising:

a capacitor having a first and second terminal;

a first switching means, coupled to a first control line for controlling switching, for selectively coupling said first terminal of said capacitor to a source of said first signal and charging said capacitor;

a second switching means, coupled to a second control line for controlling switching, for selectively coupling said first terminal of said capacitor to a first potential, and for discharging the charge on said capacitor;

a third switching means, coupled to a third control line for controlling switching, for coupling said second terminal of said capacitor to said first potential and discharging said capacitor;

a computer means for selecting which polarity of said dual polarities is required;

a waveform generation means, coupled through said first, second and third control lines to said first, second and third switching means, and coupled to said selecting means, for generating a first set of waveforms to control said first, second and third switching means when one polarity of said dual polarities is selected, and a second set of waveforms to control said first, second and third switching means when the other polarity of said dual polarities is selected;

said first set of waveforms for first causing said second and third switching means to couple said first and second terminal of said capacitor to said first potential, next causing said third switching means to decouple said second terminal from said first potential, and then causing said first switching means to couple said first terminal to said first signal having a single polarity, and

said second set of waveforms for first causing said first switching means to couple said first terminal of said capacitor to said first signal having a single polarity and said third switching means to couple said second terminal of said capacitor to said first potential; and then causing said third switching means to decouple said second terminal from said first potential and said second switching means to couple said first terminal to said first potential;

whereby said second signal having said dual polarity is generated from said first signal at said second terminal of said capacitor.

4,450,366

IMPROVED CURRENT MIRROR BIASING ARRANGEMENT FOR INTEGRATED CIRCUITS

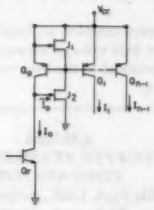
Satwinder D. Malhi, 24 Brunswick Ave., Toronto, Ontario, Canada (M5S 2L7), and Clement A. Salama, 66 Castlewood Rd., Toronto, Ontario, Canada (M5N 2L2)

Filed Sep. 23, 1981, Ser. No. 304,999

Claims priority, application Canada, Sep. 26, 1980, 362481

Int. Cl.³ H03F 3/345, 3/16; H03L 5/00

U.S. Cl. 307—297 6 Claims



1. Biased electronic circuit of current mirror type comprising:

(a) an pnp transistor having its emitter connected to a voltage source;

(b) an npn transistor having its collector connected to the collector of the pnp transistor and having its emitter coupled to a reference voltage, and having its base for controlling a current through its collector;

(c) two field effect transistors having their drain-source current paths connected in series said voltage source and said reference voltage, the gates of the field effect transistors being connected respectively to the emitter and collector of the pnp transistor and the base of the pnp transistor being connected to the junction of the two field effect transistors;

(d) at least one other pnp transistor having its base connected to the base of the first-mentioned pnp transistor and having its emitter-collector current path coupled to said voltage source for supply of bias voltage therefrom; and

(e) at least the field effect transistor having its base connected to the pnp transistor collector being operated at negligible gate current whereby the collector current of the npn transistor determines the said bias voltage.

4,450,367

DELTA V_{BE} BIAS CURRENT REFERENCE CIRCUIT

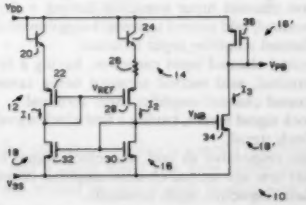
Roger A. Whatley, Austin, Tex., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 14, 1981, Ser. No. 330,062

The portion of the term of this patent subsequent to Aug. 3, 1999, has been disclaimed.

Int. Cl.³ G05F 3/16; H03L 1/00, 5/00

U.S. Cl. 307—297 11 Claims



1. A ΔV_{BE} bias current reference circuit comprising:

reference voltage means comprising a first bipolar transistor, for providing a reference voltage proportional to a bias current;

reference current means coupled to the reference voltage means comprising a second bipolar transistor coupled in series with a resistor, for providing a reference current proportional to the ratio of the difference in the base to emitter voltages, ΔV_{BE}, of said first and second bipolar transistors and the resistance of said resistor;

bias voltage means coupled to the reference current means, for providing a bias voltage proportional to said reference current; and

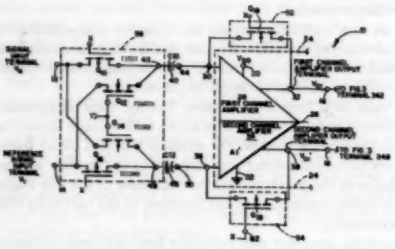
bias current means coupled to both the reference voltage means and the bias voltage means, for providing the bias current proportional to the bias voltage for said reference voltage means.

4,450,368

AC COUPLED CHOPPER STABILIZED DIFFERENTIAL COMPARATOR

John R. Spence, Villa Park, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Dec. 21, 1981, Ser. No. 332,634
Int. Cl.³ H03K *3/023, 5/24*
U.S. Cl. 307—362 **15 Claims**



1. An ac coupled differential comparator circuit characterized as receiving a differential signal voltage applied between a signal input terminal and a reference signal input terminal, providing differential outputs at a first and second differential output terminal and being characterized as operating from a voltage source with respect to a reference potential comprising:

amplifier means, characterized by a first stage differential amplifier having

a first channel amplifier having an input terminal and an output terminal, said first channel amplifier output terminal being connected to said first differential output terminal, and

a second channel amplifier having an input terminal and an output terminal, said second channel amplifier output terminal being connected to said second differential output terminal, and having a gain essentially equal to the gain of said first channel amplifier;

a first channel input capacitor having a first and second terminal, said second terminal being connected to said first channel amplifier input terminal,

a second channel input capacitor, having a first and second terminal, said second terminal being connected to said second channel amplifier input terminal,

a clock signal means, having a first clock signal and a second clock signal,

means responsive to said first clock signal for connecting said first and second channel amplifier output terminals to their respective input terminals,

signal input selection means for connecting said signal input terminal to said first channel input capacitor first terminal, and for connecting said reference signal input terminal to said second channel input capacitor first terminal, in response to only said first clock signal,

said signal input selection means connecting said signal input terminal to said second channel input capacitor first terminal and connecting said reference signal input terminal to said first channel input capacitor first terminal, in response to only said second clock signal,

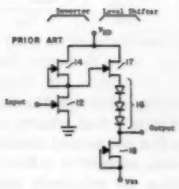
whereby said differential signal voltage between said signal input terminal and said reference signal input terminal is amplified, said amplified differential voltage being provided as a differential output voltage between said first and second channel amplifier output terminals having reduced amplifier offset voltage error.

4,450,369

DYNAMIC MESFET LOGIC WITH VOLTAGE LEVEL SHIFT CIRCUIT

Fritz L. Schuermeyer, 1759 Southview Dr., Yellow Springs, Ohio 45433

Filed May 7, 1981, Ser. No. 261,358
Int. Cl.³ H03K *19/094, 19/20, 23/08*
U.S. Cl. 307—450 **5 Claims**



1. A circuit having an inverting logic stage, comprised of FET devices, which includes a load device connected between a dc bias supply and a junction point, logic means connected between said junction point and a reference point, voltage level shift means connected between said junction point and an output of said inverting logic stage, a next stage having an input, with an FET device having a Schottky barrier between said input and the reference point, and a connection from said output of the inverting logic stage to said input of the next stage;

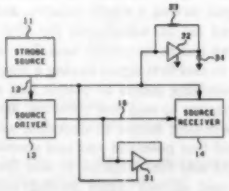
the improvement wherein said voltage level shift means comprises: a capacitor connected between said junction point of said FET inverting logic stage and said Schottky barrier input of the next stage FET device, in an overall dynamic logic circuit in which said capacitor is self-biased only by active logic signals having a period which is insignificant relative to the capacitor discharge time.

4,450,370

ACTIVE TERMINATION FOR A TRANSMISSION LINE

Thomas T. Davis, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jan. 31, 1979, Ser. No. 8,149
Int. Cl.³ H03K *19/003, 19/092*
U.S. Cl. 307—475 **1 Claim**



1. Apparatus comprising:

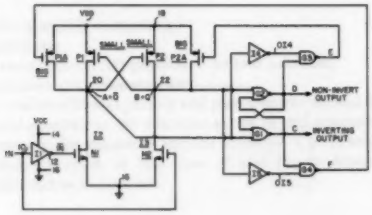
a source of electrical strobe signals;
a transmission line means for transmitting said electrical strobe signals;
an enabled tri-state buffer means;
a resistor;
means for electrically connecting the output of said enabled tri-state buffer means to the input of said enabled tri-state buffer means through said resistor;
means for electrically connecting said transmission line to the input of said enabled tri-state buffer means;
a capacitor; and
means for electrically connecting the output of said tri-state buffer means to ground through said capacitor.

4,450,371

SPEED UP CIRCUIT

Otto H. Bismarck, Fords, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Mar. 18, 1982, Ser. No. 359,434
Int. Cl.³ H03K *5/12, 19/017*
U.S. Cl. 307—475 **7 Claims**



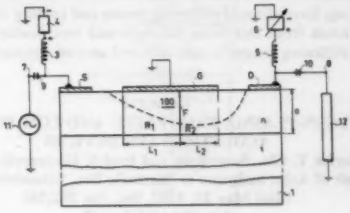
1. The combination comprising:
first and second power terminals for the application thereto of first and second operating potentials, respectively;
first and second input terminals for the application thereto of complementary input signals;
first and second outputs at which are produced output signals in response to said input signals;
first and second switching transistors, each having a conduction path and a control electrode;
means connecting the conduction paths of said first and second transistors between said first and second outputs, respectively, and said first power terminal;
means connecting the control electrodes of said first and second transistors to said first and second input terminals, respectively;
third, fourth, fifth and sixth transistors each having a conduction path and a control electrode; said third and fourth transistors, when turned-on, having a much higher impedance than the ON-impedance of said first, second, fifth and sixth transistors;
means connecting the conduction paths of said third and fifth transistors in parallel between said first output and said second power terminal;
means connecting the conduction paths of said fourth and sixth transistors in parallel between said second output and said second power terminal;
means coupling the control electrode of said third transistor to said second output and the control electrode of said fourth transistor to said first output; and
means responsive to the signal at said first and second outputs coupled to the control electrodes of said fifth and sixth transistors for momentarily turning-on the fifth transistor and maintaining the sixth transistor turned-off when said second transistor is initially turned-on; and for momentarily turning-on the sixth transistor and maintaining said fifth transistor turned off when said first transistor is initially turned-on.

4,450,372

ELECTRONIC CONTROL VARIABLE PHASE SHIFT DEVICE COMPRISING A LONG GATE FIELD EFFECT-TRANSISTOR AND A CIRCUIT USING SUCH A DEVICE

Félix Diamand, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Apr. 28, 1982, Ser. No. 372,797
Claims priority, application France, Apr. 30, 1981, 81 08664
Int. Cl.³ G01R *25/00*
U.S. Cl. 307—511 **3 Claims**



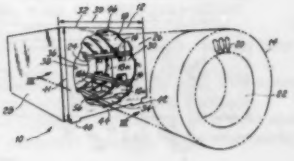
1. An electronic control variable phase shift device operable in a very high frequency range of 10 GHz, comprising:
at least one field effect transistor having a high resistivity substrate, an n type active layer formed on said substrate, and source and drain electrodes and a respective single gate electrode formed on said active layer, said active layer having a thickness at least equal to one micron and said single gate electrode having a length at least twice the thickness of said active layer so that at a predetermined frequency of use, under a predetermined negative bias condition, a phase shift in the range of 85–140 sexagesinal degrees is derived between an input signal applied between said source and gate electrodes and at output signal derived across said drain and gate electrodes; and
a variable d.C. bias supply applied between said drain and gate electrodes to cause said phase shift to vary.

4,450,373

APPARATUS FOR VIBRATION REDUCTION IN DYNAMOELECTRIC MACHINES

William H. Miller, Albany, and Joseph J. Frank, Esperance, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Sep. 12, 1983, Ser. No. 531,556
Int. Cl.³ H02K *5/24, 1/12*
U.S. Cl. 310—51 **12 Claims**



1. Apparatus for reducing vibration in a motor comprising a rotor; a stator; and a sheet metal box type motor housing including first and second apertured ends in alignment with said rotor;
a pair of end shields containing bearing support members for containing bearings rotatably supporting said rotor and

adapted to close said apertured ends upon a partially recessed assembly therewith and therein;

first and second mounting rails axially disposed along a bottom of said housing parallel with said rotor and effective to permit mounting said motor to a mounting surface;

first and second axially disposed gussets spaced on opposite sides of said stator support member adjacent said mounting rails;

stiffening means adjacent to a portion of the lower inside surface of said first and second ends and welded thereto;

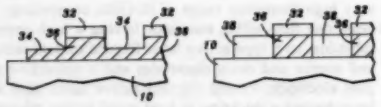
said end shield and said motor housing having force transmission means incorporated therein for transmitting bearing forces to said stiffening means and passing vibrational loads from said rotor through said end shields and said stiffening means to said first and second support rails.

4,450,374

OXYGEN-PLASMA PASSIVATED AND LOW SCATTER ACOUSTIC WAVE DEVICES

Frederick Y. Cho, Scottsdale, and Fred S. Hickernell, Phoenix, both of Ariz., assignors to Motorola Inc., Schaumburg, Ill.

Filed May 27, 1982, Ser. No. 382,758
Int. Cl.³ H03H *9/42*
U.S. Cl. 310—313 B **3 Claims**



1. A low-scatter surface acoustic wave device comprising:

a substrate;

at least one transducer on said substrate having a plurality of inter-digital fingers; and

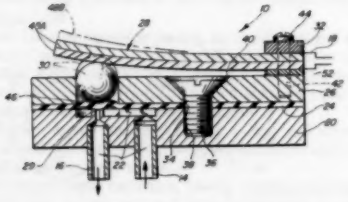
a plurality of insulating regions, each of said insulating regions lying in a gap between adjacent ones of said plurality of inter-digital fingers and filling said gap, said inter-digital fingers and said insulating regions being formed from a single layer of metal.

4,450,375

PIEZOELECTRIC FLUID CONTROL DEVICE

Burton L. Siegal, Skokie, Ill., assignor to KIWI Coders Corporation, Wheeling, Ill.

Filed Nov. 12, 1982, Ser. No. 440,966
Int. Cl.³ H01L *41/08*
U.S. Cl. 310—331 **14 Claims**



1. A piezoelectric device for selectively dispensing desired quantities of a fluid under pressure comprising:

A. a valve body having a fluid chamber and inlet and outlet means communicating with said chamber with said inlet means adapted to be connected to a source of said fluid under pressure; and

B. fluid control valve means for controlling such fluid dispensation through said outlet means comprising:

I. said body having at least one valve seat communicating with said outlet means;

II. a deformable member mounted on the valve body in cooperation with said valve seat effective to control communication with said outlet means about said valve seat and impacting means directly engageable with the deformable member for selectively distorting said member proximate said valve seat to change the condition of said deformable member about said valve seat so as to establish or disrupt such communication with said outlet means as desired; and

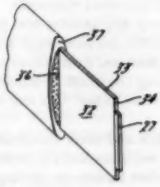
C. piezoelectric bender means mounted on the valve body isolated from said fluid chamber and adapted to be electrically connected to a D.C. source; said bender means including a deflectable portion engaging said impacting means to move same selectively upon energizing or deenergizing of said piezoelectric bender means for selectively distorting the deformable member without either said impacting means or said bender means contacting said fluid.

4,450,376

TRANSMISSION MEDIUM FOR APPLICATION IN ELECTRICAL AND ACOUSTICAL CONTROL SYSTEMS

Allen H. Meitzler, Ann Arbor, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Division of Ser. No. 331,721, Dec. 17, 1981. This application May 18, 1983, Ser. No. 495,899
Int. Cl.³ H01L *41/08*; H01B *7/00*
U.S. Cl. 310—334 **6 Claims**



1. An insulated transmission medium defining a path for propagating both ultrasonic waves and electromagnetic energy therealong, comprising:

an elongated strip of metal having low resistance properties with respect to both ultrasonic wave propagation and electromagnetic energy conduction and having a width dimension which is at least 20 times greater than its thickness dimension;

a core of insulating material extending substantially over the length and width of said strip and having the properties of a high dielectric and negligible damping to ultrasonic waves propagating along the strip; and

an outer insulator encasing said core insulator and said strip, and contacting at least the edges of said strip substantially along its length and having properties of a high dielectric and high damping to ultrasonic waves occurring at the edges of said strip.

4,450,377

INTEGRATED CIRCUIT WITH PIEZOELECTRIC RESONATOR MOUNTED ON BLOCKS COMPRISING CAPACITORS

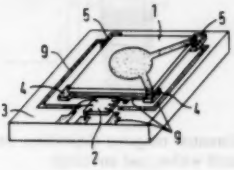
Wolfgang Briese, Berlin, Fed. Rep. of Germany, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Sep. 28, 1981, Ser. No. 306,558

Claims priority, application Fed. Rep. of Germany, Oct. 10, 1980, 3038261

Int. Cl.³ H01L 41/08, 41/04

U.S. Cl. 310—348 6 Claims



1. An assembly comprising:
a substrate;
an electronic circuit positioned on said substrate;
a piezoelectric resonator; and
a plurality of blocks joining said piezoelectric resonator with said substrate at the vibration nodes of said resonator and spacing the resonator and the substrate a predetermined distance apart, at least one of said blocks being constructed as a capacitor.

4,450,378

ZT-CUT PIEZO-ELECTRIC RESONATOR

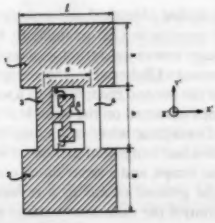
Jean Hermann, Neuchatel, and Claude Bourgeois, Bole, both of Switzerland, assignors to Centre Electronique Horloger S.A., Switzerland

Filed Jan. 25, 1983, Ser. No. 460,910

Claims priority, application France, Feb. 16, 1983, 82 02497

Int. Cl.³ H01L 41/08

U.S. Cl. 310—361 11 Claims



1. A clamped piezoelectric resonator fabricated in a ZT-cut quartz substrate comprising two thin rectangular plates connected together by at least one resonant arm, said resonant arm being coupled to at least one support zone and said resonant arm having a resonant frequency which is substantially the same as the resonant frequency of said plates.

4,450,379

CATHODE RAY TUBE

Masahiro Kikuchi, Yokohama; Hisashi Utena, Funabashi, and Shinzo Takei, Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

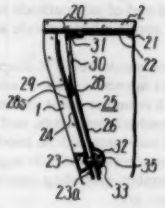
Continuation of Ser. No. 255,171, Apr. 17, 1981, abandoned.

This application May 26, 1983, Ser. No. 498,584

Claims priority, application Japan, Apr. 30, 1980, 55-60437[U]

Int. Cl.³ H01J 31/00

U.S. Cl. 313—477 HC 4 Claims



1. A cathode ray tube, comprising, an envelope consisting of a flat panel, a funnel and a neck, said flat panel having a phosphor layer and a conductive layer respectively coated on its inner surface, said funnel being provided with an anode button, and an anode contactor attached to said anode button at its inner end on an axis of support, said anode contactor comprising an electrically conducting planar member having a first end and a second end formed with an opening near said first end through which said anode button extends to make electrical contact, a projection extending transversely from said second end of said planar member and making contact with the inner surface of said funnel, and a first planar flexible electrically conducting finger having two ends, one of said two ends extending from the second end of said planar member and orientated so that its width dimension lies in a plane which is at right angles to the plane of said planar member extending parallel with the funnel from the transversely extending projection and the other of said two ends of said first flexible finger moveable in a plane perpendicular to said axis of support and making flexible contact with said conductive layer on the inner surface of said flat panel.

4,450,380

MULTI-ELECTRODE ARRAY FOR A BEAM MODE FLUORESCENT LAMP

Joseph M. Proud, Wellesley Hills; Leslie A. Riseberg, Sudbury; Wojciech W. Byszewski, Arlington, and A. Bowman Budinger, Westford, all of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed Jan. 4, 1982, Ser. No. 336,794

Int. Cl.³ H01J 1/62, 63/04

U.S. Cl. 313—485 10 Claims

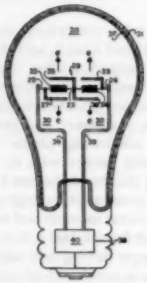
1. A multi-electrode beam mode fluorescent lamp comprising:
a light transmitting envelope enclosing a fill material which emits ultraviolet radiation upon excitation;
a phosphor coating, which emits visible light upon absorption of ultraviolet radiation, on an inner surface of said envelope;
a thermionic cathode having a first and a second end located within said envelope for emitting electrons, said cathode including a plurality of thermionic cathode segments connected in series;
means for coupling AC voltage to said ends of said thermionic cathode;
a plurality of anodes including an initial anode, at least one intermediate anode and a final anode, each of said anodes located within said envelope for accelerating electrons

and alternately forming corresponding first and second pluralities of electron beams, each plurality of electron beams in response to a corresponding cycle of said AC voltage applied between said anodes and said cathode, each of said anodes being spaced apart from said cathode by a distance which is approximately less than the electron range in said fill material and having a structure which permits said electron beams to pass thereby;

said initial anode being L-shaped and connected to said first end of said cathode and extending under a first cathode segment of said plurality;

said final anode being L-shaped, said final anode connected to said second end of said cathode and extending opposite to said initial anode a last cathode segment of said plurality;

said intermediate anode being Z-shaped with first and second horizontal members, each of said intermediate anodes connected at a common point to one of said series connections of said cathode segments, said first horizontal member of each of said intermediate anodes extending over one of said series connected cathode segments and said second horizontal member extending opposite to said first horizontal member; and



first and second pluralities of drift regions, each drift region located within said envelope through which said first and said second pluralities electron beams drift after passing through said plurality anodes, each of said drift regions having a dimension in the direction of travel of said respective electron beam which is greater than the electron range in said fill material, so that the electrons in each of said electron beams collide with the atoms of said fill material in said respective drift region, thereby causing excitation of a substantial portion of said fill material atoms and emission of ultraviolet radiation and causing ionization of another substantial portion of said fill material atoms and emission of secondary electrons, said secondary electrons causing emission of additional ultraviolet radiation and resulting in a substantial amount of visible light;

said electron beams in said first plurality of drift regions all in one direction and alternately said electron beams in said second plurality of drift regions all in a direction opposite to said electron beams of said first plurality of drift regions.

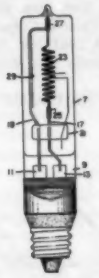
4,450,381

TUNGSTEN-HALOGEN LAMP WITH PREFERENTIAL TUNGSTEN DEPOSITION SITE

George B. Kendrick, Lexington, Ky.; George L. Duggan, Bedford, Mass., and Carlos Ochoa, El Paso, Tex., assignors to GTE Products Corporation, Stamford, Conn.

Filed Apr. 5, 1982, Ser. No. 365,667
Int. Cl.³ H01K *1/04*
U.S. Cl. 313—579 **10 Claims**

1. A tungsten-halogen incandescent lamp having a hermetically sealed light-transmitting envelope containing a fill of inert gas and halogen and a coiled tungsten filament supported within the envelope and characterized by the improvement



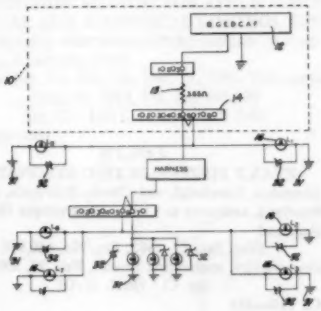
wherein a preferential tungsten deposition site of palladium material is located within said envelope.

4,450,382

D.C. LAMP BURN-OUT PROTECTION

Steven Sawka; Vincent Moretti, and Sam F. Heal, all of Macomb, Mich., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jun. 21, 1982, Ser. No. 390,426
Int. Cl.³ B60Q *1/02*
U.S. Cl. 315—082 **3 Claims**



1. In a trailer electrical lighting system comprising a first electrical receptacle (12) adapted to be coupled to a remote D.C. voltage source on a tractor, a second receptacle (14), and resistor means (13) between the receptacles for dropping the voltage at the second receptacle to a voltage rating V_L; a number of lamps mounted on the vehicle at selected points thereon; individual energizer wires extending from the second receptacle to individual lamps and groups of lamps; ground means for the various lamps; and a zener diode connecting each energizer wire to the ground means in a reverse biased orientation to thereby control the maximum voltage applied to the individual lamps; the collective wattage ratings of the zener diodes being equal to the arithmetical product of the D.C. voltage V_s and the summation of safe amperages drawn by all lamps in the system, whereby the zener diodes collectively protect the lamps against over-voltage and/or overamperage; each zener diode having a breakdown voltage V_z that is only slightly greater than the voltage V_s, whereby transient increases in voltage V_s produce a current flow through the zener diodes.

4,450,383

ELECTRIC ARRANGEMENT FOR STARTING AND SUPPLYING A LOW-PRESSURE DISCHARGE LAMP

Johannes A. J. M. van Vliet, and Auke G. van der Kooi, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 25, 1982, Ser. No. 392,112

Claims priority, application Netherlands, Jul. 24, 1981, 8103507

Int. Cl.³ H05B 41/18

U.S. Cl. 315—106 6 Claims

1. An electric arrangement for starting and supplying a low-pressure discharge lamp of the type having a discharge space containing a metal vapor and a rare gas, a discharge path in said space between two electrodes, and a shunt path in said space which shunts at least a portion of the discharge path, which shunt path has a thickness H of not more than 2 mm and a length L (in mm), the lamp requiring a minimum of A volts between the electrodes for starting a discharge in the discharge path, the arrangement comprising an inductive stabilization ballast for connection in series with the discharge path between two terminals intended for connection to an A.C. voltage source, characterized in that the arrangement further comprises a glow-discharge starter and a voltage-limiting element each arranged for connection to the lamp in parallel with the discharge path, said element having a threshold voltage of D volts which satisfies the equations

$$\log D < [2 + (\log L/5Hf)], \text{ and}$$

$$A < D,$$

where f is the ratio of the length of the discharge path shunted by the gap to the length of the whole discharge path.

4,450,384

DC LIGHT DIMMER CONTROL SYSTEM

William G. Krokaugger, Chatsworth, Calif., assignor to Mole-Richardson Company, Hollywood, Calif.

Filed Aug. 4, 1982, Ser. No. 405,278

Int. Cl.³ H05B 37/02

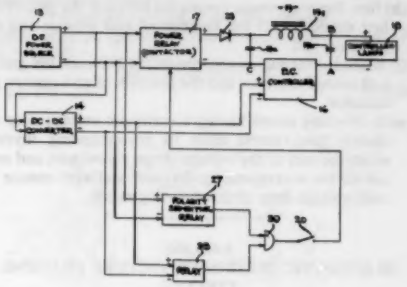
U.S. Cl. 315—127 5 Claims

1. A light dimmer control system for controlling the current supplied from a DC power source to a high power illuminating lamp comprising

DC-DC converter means connected to said DC power source for generating a DC voltage substantially lower than that of said power source,

DC controller means including a manually operable control, the controller means being connected in the current path between the lamp and the DC power source for controlling the current supplied to the lamp in response to said manually operable control, said DC controller means receiving its operating power from the DC-DC converter, and

logical control circuit means responsive to the outputs of said power source and said DC-DC converter for preventing the connection of said DC power source to the con-



troller means and lamp except when both the polarity of the output of the DC power source is correct and the output of the DC-DC converter is present.

4,450,385

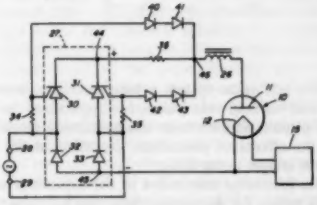
INDUCTIVE BALLASTING OF DIRECT CURRENT GAS DISCHARGES

Carl F. Buhrer, Framingham, Mass., assignor to GTE Laboratories Incorporated, Waltham, Mass.

Filed Aug. 9, 1982, Ser. No. 406,601

Int. Cl.³ H05B 41/16

U.S. Cl. 315—205 3 Claims



1. A ballast circuit for gaseous electrical discharge devices comprised of

(a) means for connecting said circuit to a gaseous discharge device;

(b) an inductor in series with said device for storing excess energy;

(c) a rectifier bridge having positive and negative outputs and having ports for coupling to a source of alternating voltage, said bridge including: a first and a second thyristor, each thyristor having an anode, a cathode and a gate, and a maximum gate to cathode voltage drop; and a first and second rectifying diode;

the cathode of said thyristors connected together and forming the positive output of the bridge;

the anodes of the diodes connected together and forming the negative output of the bridge;

the anode of the first thyristor and the cathode of the first diode connected together and to one input port;

the anode of the second thyristor and the cathode of the second diode connected together and to another input port;

(d) means for coupling said input ports to a source of alternating voltage;

(e) a resistor connected between the connected cathodes of said thyristors and said inductor;

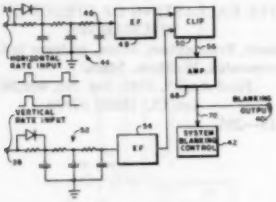
(f) means for supplying a voltage to the gate of said first thyristor;
(g) means for supplying a voltage to the gate of said second thyristor;
(h) first diverting means connected between the gate of said first thyristor and the junction of said resistor and said inductor; and
(i) second diverting means connected between the gate of said second thyristor and the junction of said resistor and inductor,
each diverting means having a maximum voltage drop and diverts gate current from its corresponding thyristor when the sum of the voltage drops across gate and cathode of the corresponding thyristor and said resistor exceed voltage drop of the diverting means.

4,450,386

ELECTRONIC TELEVISION PICTURE FRAMING CIRCUIT

Stanley E. Lehnert, Addison, Ill., assignor to Zenith Radio Corporation, Glenview, Ill.

Filed Nov. 30, 1981, Ser. No. 325,783
Int. Cl.³ H01K *29/56*
U.S. Cl. 315—371 **11 Claims**



1. In a television system which develops horizontal rate pulses and vertical rate pulses for application to a blanking control circuit, an electronic image framing circuit for eliminating the effects of pincushion distortion at the edges of a television image, comprising:
a pulse processor responsive to the horizontal and vertical rate pulses for developing blanking pulses whose widths are varied at a vertical rate for blanking the portions of each video line which extend beyond a desired image boundary; and
means for coupling the blanking pulses to the blanking control circuit.

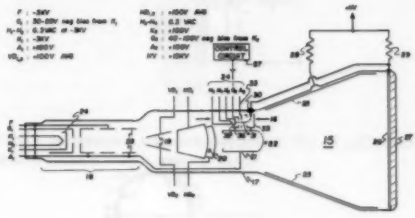
4,450,387

CRT WITH INTERNAL THERMIONIC VALVE FOR HIGH VOLTAGE CONTROL

Ronald G. Reed; Robin R. Schmuckal, and Robert K. McCullough, all of Colorado Springs, Colo., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Mar. 30, 1981, Ser. No. 248,925
Int. Cl.³ H01J *29/80*
U.S. Cl. 315—375 **9 Claims**

1. A split anode penetration cathode ray tube comprising:
an evacuated envelope including funnel and faceplate portions;
electron gun means for producing an electron beam to strike the faceplate;
a conductive layer of beam penetration phosphors, located upon the interior surface of the faceplate poriton of the envelope, for producing a visible indication at the location of the impact of the electron beam upon the faceplate;
a conductive coating upon the inside surface of the funnel portion of the envelope for accelerating the electron beam toward the faceplate, the conductive coating electrically isolated from the conductive layer of beam penetration phosphors;
a cathode for emitting electrons;
plate means, electrically connected to the conductive layer of beam penetration phosphors, for attracting the electrons emitted by the cathode, and for controlling the magnitude of the voltage applied to the conductive layer of beam penetration phosphors;
grid means, located between the cathode and the plate means, for controlling the quantity of emitted electrons reaching the plate means;



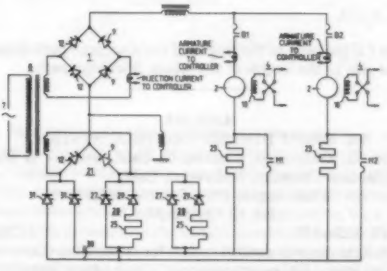
a source of high voltage;
a first resistance connected between the source of high voltage and the conductive layer of beam penetration phosphors;
a second resistance connected between the source of high voltage and the conductive coating inside the funnel portion; and
control means, coupled to the grid means, for controlling the voltage applied to the conductive layer of beam penetration phosphors.

4,450,388

DYNAMIC BRAKING OF DIRECT CURRENT MOTORS

John D. Markham, Droylsden, England, assignor to Associated Electrical Industries Limited, England

Filed Oct. 22, 1982, Ser. No. 435,951
Claims priority, application United Kingdom, Oct. 26, 1981, 8132208
Int. Cl.³ H02P *3/12*
U.S. Cl. 318—87 **8 Claims**



1. A dynamic braking system for a D.C. motor, the system comprising a undirectional current path including a controllable current source, a motor armature and a brake resistance, said brake resistance comprising a portion associated with bypass means, the system further comprising means for reversing the relative directions of field and armature current to permit rheostatic braking by the dissipation in said brake resistance of energy generated by the motor in a braking condition and to permit injection braking by reverse driving of the motor, and control means responsive to the total armature current

in a braking condition to effect first rheostatic braking then additionally injection braking, said control means being responsive to injected armature current to effect bypassing of said portion of brake resistance at a predetermined braking condition.

4,450,389

VEHICULAR-TYPE GENERATOR AND FORCED AIR COOLING BLOWER COMBINATION

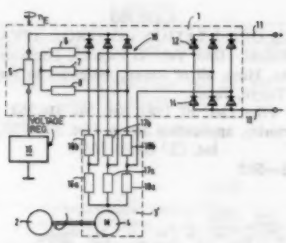
Manfred Frister, Schwieberdingen, and Bernhard Fakler, Easslingen, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Aug. 5, 1982, Ser. No. 405,534

Claims priority, application Fed. Rep. of Germany, Aug. 27, 1981, 3133880; Nov. 12, 1981, 3144957

Int. Cl.³ H02P 7/66

U.S. Cl. 318—140 12 Claims



1. Vehicular generator-forced air circulation blower combination having

a three-phase alternator (1) adapted to be driven at widely varying speeds (n_G) from a vehicular-type engine to supply a self-contained network (11, 13) with direct current power having

a field winding (5);

a plurality of armature windings (6, 7, 8) corresponding to the phases of the alternator;

a power rectifier system (12, 14) connected to the respective armature windings and providing direct current output for the self-contained network (11, 13),

a blower (2) providing forced air circulation (A);

and comprising

an induction motor (4) mechanically connected to the blower (2) to drive the blower with a drive torque which depends on frequency of the alternating current output from the alternator; and

wherein the motor is a three-phase motor having three motor armature windings, the motor armature windings being subdivided into motor winding portions (16*a*, 16*b*; 17*a*, 17*b*; 18*a*, 18*b*), one of the motor winding portions (16*a*, 17*a*, 18*a*) of the motor armature windings being voltage windings connected in parallel across the armature windings (6, 7, 8) of the alternator, and the other motor armature winding portions (16*b*, 17*b*, 18*b*) of the motor armature winding being current windings, serially connected between the respective armature windings (6, 7, 8) of the alternator and the rectifier system (12, 14).

4,450,390

WINDOW LIFTER AND DOOR LOCKING SYSTEM

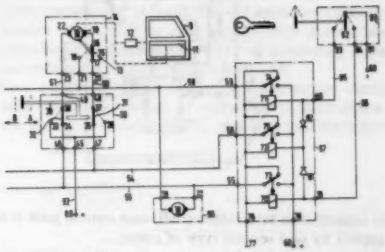
Marcel Andrei-Alexandru, and Hans Prohaska, both of Bietigheim-Bissingen, Fed. Rep. of Germany, assignors to ITT Industries, Inc., New York, N.Y.

Filed Apr. 16, 1982, Ser. No. 369,259

Claims priority, application Fed. Rep. of Germany, Apr. 28, 1981, 3116737

Int. Cl.³ B60R 25/04

U.S. Cl. 318—282 8 Claims



1. A control circuit for a combined motor-driven window lifter and door locking system having a plurality of reversible motors each of which are respectively assigned to a door having window lifter and door locking devices therein and wherein continued rotation of said motors past their window closed positions results in a door locking operation, said control circuit comprising:

a plurality of position switches (13) respectively coupled to each of said motors, each of said switches having a movable contact (15) connected to one terminal (19) of its associated motor and which is actuated by its associated motor (10) from a first contact (17) at a first switch position corresponding to the unlocked door and window open positions of said motor in a first rotational direction to a second contact (18) at a second switch position corresponding to the window closed end position of said motor (10) in the opposite rotational direction;

a plurality of reversing switches (30) respectively coupled to the terminals of each of said motors through said first contact (17) of said position switches (13) for reversing the polarity of the voltage source applied to the terminals of its associated motor (10), thereby to open or close the window;

a central switch (90) having door locking and door unlocking switch positions; and,

means responsive to said central switch (90) for selectively applying one pole (60) of said voltage source to said second contact (18) of said motors or to the terminal (22) of said motors other than said one terminal thereby to respectively lock or unlock said door locking device.

4,450,391

CENTRIFUGE PROTECTIVE CIRCUITS FOR PREVENTING EXCESSIVE SPEED OF DIFFERENT ROTOR TYPES

Minoru Hara, Sakado, Japan, assignor to Kabushiki Kaisha Kubota Seisakusho, Tokyo, Japan

Filed Feb. 8, 1983, Ser. No. 464,813

Claims priority, application Japan, Feb. 17, 1982, 57-21823[U]

Int. Cl.³ G05B 9/00, 11/12, 11/18

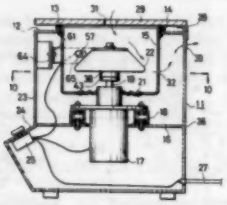
U.S. Cl. 318—313 11 Claims

1. An automatic rotor type discriminator for a centrifuge adapted so that different types of rotors can be mounted on a motor shaft, comprising:

a light emitting element disposed in an outer housing of the centrifuge, for emitting light;

a photo detector disposed in said outer housing in opposing

relation to said light emitting element, for receiving and converting light from said light emitting element into an electric signal, said light emitting element and said photo detector being positioned so that when a first type of rotor is mounted on said motor shaft, the optical path between said light emitting element and said photo detector is not intercepted by said first type of rotor, but that when a second type of rotor different from said first type of rotor



is mounted on said motor shaft, said optical path is intercepted by said second type of rotor;

deciding means for determining from the output of said photo detector whether said optical path is intercepted by the rotor mounted on said motor shaft; and

maximum revolving speed setting means for setting a maximum revolving speed of said rotor mounted on said motor shaft in accordance with the determination of said deciding means.

4,450,392

ELECTRONIC SPEED REGULATOR FOR A D.C. MOTOR

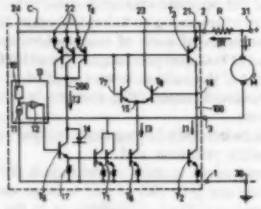
Jean-Pierre Gaslonde, Caen, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 9, 1981, Ser. No. 319,167

Claims priority, application France, Mar. 20, 1981, 81 05631

Int. Cl.³ G05B *5/00*

U.S. Cl. 318—317 **4 Claims**



1. An electronic speed regulator, for controlling an associated d.c. motor having first and second connection points, which comprises:

a power supply having first and second poles; a resistor; an integrated circuit having first, second and third terminals, said first terminal of said integrated circuit being connected to said first pole of said power supply, said second terminal of said integrated circuit being connected to said second pole of said power supply via said resistor, and said third terminal of said integrated circuit being connected to said first connection point of said motor;

said second connection point of said motor being connected to said second pole of said power supply,

said integrated circuit comprising means enabling a substantially constant voltage to be maintained across said second and third terminals thereof regardless of the load on the motor, said means comprising a voltage reference stage, an arrangement of first and second transistors of a first type which are interconnected by their bases to form a first current mirror,

said first transistor being arranged between said first and third terminals, said second transistor supplying a current which is the image of that supplied by said first transistor and is arranged in series in a first circuit branch situated between said first and second terminals of said integrated circuit, and a source which supplies a base current to said first and second transistors,

said source comprising an arrangement of third and fourth transistors of a second type opposite to said first type, said third and fourth transistors being interconnected by their bases to form a second current mirror, said third transistor being arranged in said first circuit branch in series between said second transistor and said second terminal of said integrated circuit, said fourth transistor, which supplies a current which is the image of that from said third transistor, being arranged in a second circuit branch between said first and said second terminals of said integrated circuit,

said second branch being further connected to the bases of said first and said second transistors, said means including means for comparing the voltage between the second and third terminals with a reference voltage from said voltage reference stage and controlling in response thereto the voltage on the base terminals of the first and second transistors to maintain the voltage between the second and third terminals.

4,450,393

SPINDLE ORIENTATION CONTROL APPARATUS

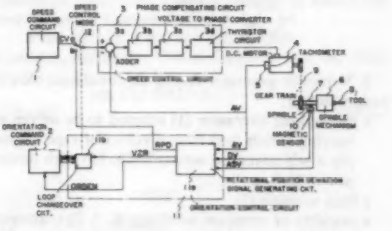
Yoshinori Kohzai, Hino; Yoshiki Fujioka, Higashiyamato, and Naoto Ota, Hino, all of Japan, assignors to Fujitsu Fanuc Limited, Tokyo, Japan

Filed Oct. 30, 1981, Ser. No. 316,762

Claims priority, application Japan, Oct. 30, 1980, 55-152702

Int. Cl.³ G05B *11/18*

U.S. Cl. 318—592 **4 Claims**



1. A spindle orientation control apparatus operatively connected to receive an orientation command signal and a speed command signal, comprising:

a spindle having an angular position and a specified rotational direction;

a motor having an actual speed, operatively connected to said spindle;

speed control means having an input operatively connected to receive said speed command signal and an output operatively connected to said motor, for controlling the actual speed of said motor and for feeding back the actual speed of said motor to said input of said speed control means;

orientation control means, having a first input operatively connected to receive the orientation command signal, having a second input operatively connected to said spindle, and having an output, for selectively providing at said output one of a coarse position deviation signal responsive to the integral of the actual speed of said motor and a fine position deviation signal;

switching means, operatively connected between said output of said orientation control means and said input of said

speed control means, for selectively providing, as an output to said speed control means, one of said speed command signal and said output of said orientation control means, in response to the orientation command signal; and

magnetic sensing means, operatively connected between said spindle and said second input of said orientation control means, for generating the fine position deviation signal responsive to the difference between a predetermined angular position of said spindle and the current position of said spindle, and for generating an approach signal responsive to a specified portion of said spindle being in the vicinity of said predetermined angular position of said spindle;

said magnetic sensing means comprising:

a magnetic body, operatively connected to said spindle, including at least two magnets having magnetic fields and arranged such that the strengths of the respective magnetic fields change from south to north in the direction of said specified rotational direction of said spindle; and

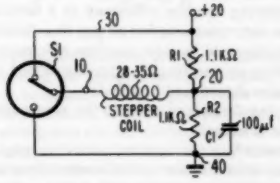
a sensing circuit, operatively connected to said orientation control means and positioned near said spindle, for sensing said magnetic body, and including two saturable reactors having coils wound thereon, for producing said fine position deviation signal and said approach signal, respectively.

4,450,394

STEPPER MOTOR DRIVE CIRCUIT

Kevin C. Kelleher, Plainfield, Ind., assignor to RCA Corporation, New York, N.Y.

Filed Mar. 5, 1982, Ser. No. 355,101
Int. Cl.³ H02K *29/04*
U.S. Cl. 318—696 **3 Claims**



1. Circuitry for providing bipolar drive to a motor winding, said winding having first and second terminals, comprising:

first and second supply terminals for applying relatively positive and relatively negative supply potentials respectively;

switch means for alternately coupling said first winding terminal to said first and second supply terminals;

first and second resistive means respectively connected between the first and second supply terminals and the second winding terminal; and

a capacitor connected between the second winding terminal and a point of fixed potential.

4,450,395

SYSTEM FOR CONTROLLING SYNCHRONOUS MOTORS

Akira Kawamura, Numazu, and Tadahiro Ono, Shizuoka, both of Japan, assignors to Toshiba Kikai Kabushiki Kaisha and Toei Denki Kabushiki Kaisha, both of Tokyo, Japan

Filed Jun. 21, 1982, Ser. No. 390,776
Int. Cl.³ H02P *5/28*
U.S. Cl. 318—700 **3 Claims**

1. A control system for driving a synchronous motor at speeds greater than rated speed, to which a desired speed signal and a signal representing the rotational position of the rotor of said motor are applied comprising:

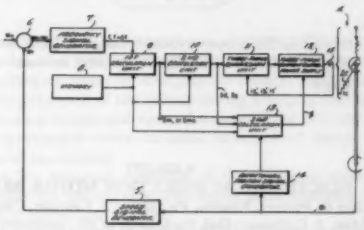
speed signal generating means for generating a rotational speed signal representing the rotational speed of said rotor;

rotational position signal generating means for generating a signal representing the rotational position of the field pole of said motor;

means for producing a difference signal between said desired speed signal and said rotational speed signal;

calculating means for calculating first armature current component value (Id) and second armature current component value (Iq) for said synchronous motor, and for calculating a power factor (ϕ) and producing signals in accordance with said calculations; and

power supplying means for supplying armature current to said armature windings of said motor in accordance with the signals of said calculating means so that the magnitude



of the armature current and voltage remain substantially constant.

3. Control system for driving a synchronous motor as in claim 1, wherein

said calculating means comprises

a frequency signal generator which produces first and second frequency signals from said difference signal;

a memory for storing values of characteristics concerning said synchronous motor;

first calculating means for calculating a torque angle value from said stored values and said frequency signals and producing a torque value signal;

second calculating means for calculating said first and second armature current values from said torque angle value signal and said stored values; and

third calculating means for calculating the phase difference between induced electromotive force and armature current.

4,450,396

ELECTRICALLY CONTROLLED SYNCHRONOUS MACHINE

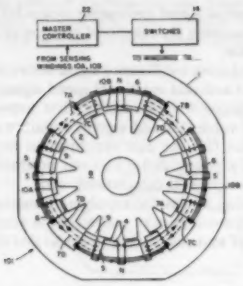
Richard D. Thornton, Concord, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Sep. 23, 1980, Ser. No. 190,019
Int. Cl.³ H02P *5/28*
U.S. Cl. 318—721 **28 Claims**

1. An electronically controlled synchronous machine that comprises: a magnetically-permeable cylindrical rotor comprising a periodic tooth structure and radial airgap;

a stator having stator windings comprising at least two armature windings and one field winding, the stator windings being situated about the stator such that self inductance in the armature windings and the field winding is substantially independent of rotor position, but the mutual induction between the armature windings and the field winding is variable with relative position between the rotor and the stator whereby continuous torque is produced when appropriately shaped and synchronized current waveforms are introduced into the armature windings; and

rotor position detector means for sensing a voltage in at least one of the stator windings and for relating that voltage to the relative position between the rotor and the stator so as



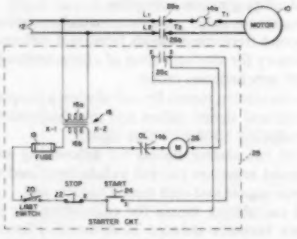
to permit the proper synchronizing of the armature current waveforms with relative position between rotor and stator.

4,450,397

ELECTRONIC AC INDUCTION MOTOR BRAKE

Walter C. Painter, Venetia, Pa.; David J. Luttmer, Chicago, and Alvin J. Galloway, Oak Park, both of Ill., assignors to Rockwell International Corporation, Pittsburgh, Pa.

Filed Sep. 30, 1982, Ser. No. 429,803
Int. Cl.³ H02P 3/24
U.S. Cl. 318—762 24 Claims



1. A braking control circuit for an alternating current motor having a winding and operative with an energizing control circuit for connecting a source of AC voltage to and for disconnecting the source of AC voltage from the winding, the motor coupled to rotatively drive a tool, the rotating tool developing a momentum to be braked, said braking control circuit comprising:

(a) selectively controlled rectifying means operative in a first conductive mode for applying rectified current pulses of variable conduction angles to the winding to brake the motor with corresponding effect and in a second non-conductive mode; and

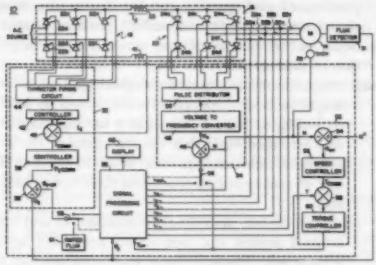
(b) sequential conduction angle control means coupled to said rectifying means and responsive to the disconnecting of the source of AC voltage from the winding for operating said rectifying means at a first, relatively large conduction angle to brake the motor at a corresponding first braking rate, and thereafter for operating said rectifying means at a second conduction angle less than said first conduction angle to brake the motor at a second, lower braking rate, whereby a controlled braking profile is effected to improve the braking efficiency of the motor.

4,450,398

MICROPROCESSOR-BASED EFFICIENCY OPTIMIZATION CONTROL FOR AN INDUCTION MOTOR DRIVE SYSTEM

Bimal K. Bose, Latham, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Apr. 5, 1982, Ser. No. 365,720
Int. Cl.³ H02P 5/34
U.S. Cl. 318—803 6 Claims



1. A method of controlling an induction machine drive during steady state operation using a microcomputer having stored machine constants, the machine drive having an stator current control loop and a stator frequency control loop, said method comprising the steps of:

(1) measuring induction machine slip, torque and air gap flux;

(2) determining machine stator copper loss, rotor copper loss and iron loss from measured variables and machine constants;

(3) determining machine efficiency from machine losses and power input to the machine;

(4) processing machine efficiency as a function of air gap flux to determine whether air gap flux should be increased or decreased to increase machine efficiency;

(5) varying air gap flux by a predetermined amount in the direction determined in step 4;

(6) varying frequency so that the previously determined torque is maintained;

(7) commanding the new values of air gap flux and frequency in said stator current control loop and said stator frequency control loop, respectively; and

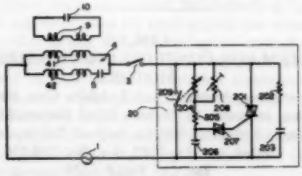
(8) repeating steps 1–8.

4,450,399

INDUCTION MOTOR

Masaru Tanaka, Hyogo, Japan, assignor to Sanyo Electric Co., Ltd., Moriguchi, Japan

Filed May 28, 1982, Ser. No. 383,310
Claims priority, application Japan, Jan. 27, 1982, 57-12431; Feb. 9, 1982, 57-10937[U]
Int. Cl.³ H02P 5/40
U.S. Cl. 318—814 14 Claims



1. An induction motor adapted to be energized by an alter-

nating current voltage source for supplying an alternating current voltage, said induction motor comprising:

conduction control means for controlling conduction of said alternating current voltage to said motor, said conduction control means repetitively interrupting said alternating current voltage thereby changing the effective voltage of said alternating current voltage;

a field winding coupled to said alternating current voltage source through said conduction control means,

a control winding electromagnetically coupled to said field winding, and

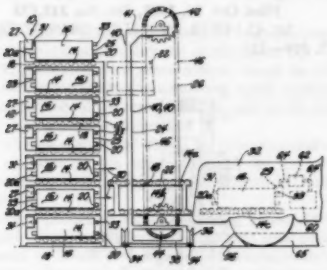
closed loop means coupled to said control winding constituting a closed loop therewith for generating an induced current in said control winding.

4,450,400

BATTERY REPLACEMENT SYSTEM FOR ELECTRIC VEHICLES

Marion V. Gwyn, 8035 Coolidge, Center Line, Macomb, Mich. 48015

Filed Dec. 4, 1981, Ser. No. 327,318
Int. Cl.³ B60K *1/04*
U.S. Cl. 320—2 **4 Claims**



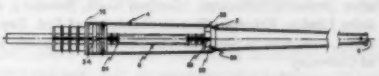
1. In association with battery-powered vehicles, the combination comprising an upright battery charging station that includes first horizontal roller support units constructed to receive battery modules for charging purposes; said support units being arranged in vertical rows, adjacent ones of the rows being in side-by-side relationship; an upright battery module transfer mechanism movable horizontally along one face of the battery charging station for selective registration with different ones of the vertical rows of horizontal roller support units in said station; an elevator carried by the transfer mechanism for selective registration with different ones of the battery modules in any given vertical row; said elevator including a second roller support unit for supporting at least one battery module thereon; and a third battery module roller support unit located within an automobile for registration with a module roller support unit on the elevator after the vehicle has been driven to a prespecified location near the path traversed by the aforementioned transfer mechanism; each battery module support unit comprising a number of horizontal rollers adapted to rollably engage the undersurface of a battery module; the various module roller support units being sufficiently close to one another when the vehicle is in the prespecified location that a given battery module can be moved horizontally from the third roller support unit to a second roller support unit and thence onto selected ones of the first roller support units; each battery module comprising a rectangular box and a plurality of batteries disposed therein; two sets of external terminals on opposite ends of the box, and electrical connections between said batteries and said external terminals; said charging station including a first electrical receptacle located above each one of the first roller support units for electrical engagement by one set of terminals on a battery box when the box is moved to its intended position in the charging station; and a second electrical receptacle located above the third roller support unit in the vehicle for electrical engagement by the other set of terminals on the battery box when the box is moved to its intended position in the vehicle.

4,450,401

CONTROL CIRCUIT FOR AUTOMATIC BATTERY CHARGERS

Frederic J. Lambert, Morrisville, Pa.; Donald J. Bosack, Barrington, and David K. Johansen, Lake in the Hills, both of Ill., assignors to GNB Batteries Inc., Mendota Heights, Minn.

Filed Jul. 9, 1982, Ser. No. 396,951
Int. Cl.³ H02J *7/00*
U.S. Cl. 320—22 **8 Claims**



1. In an apparatus for automatically charging different types of batteries to a preselected full charge state, the apparatus having charging means for charging the battery, sensing means for sensing the state of the battery during charging thereof by said charging means, and means for establishing first and second predetermined reference states, an improved charge control circuit comprising:

means for initiating operation of the charging means to charge the battery at a preselected initial charging level for an initial time period;

means for establishing a first finish time period;

first means for determining a first time at which the state of the battery reaches said first predetermined reference state during said initial time period;

means for causing the charging means to continue to charge the battery at a preselected first charging level after the determination of said first time;

means for establishing a second finish time period;

second means for determining a second time at which the state of the battery reaches said second predetermined reference state during said first finish time period;

means for terminating the charging of the battery if the state of the battery does not reach said second predetermined reference state during said first finish time period; and

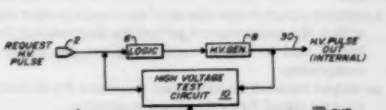
means for causing the charging means to continue to charge the battery at a preselected second charging level for a second finish time period in the event the battery reached said second predetermined reference state during said first finish time period.

4,450,402

INTEGRATED CIRCUIT TESTING APPARATUS

William H. Owen, III, Mountain View, Calif., assignor to Xicor, Inc., Milpitas, Calif.

Filed Apr. 8, 1981, Ser. No. 252,232
Int. Cl.³ G01R *31/28*
U.S. Cl. 324—73 R **15 Claims**



1. In an integrated circuit having a plurality of external pins through which one or more logic level signals are fed to the integrated circuit during normal operation, said circuit including means for generating a high voltage pulse of amplitude greater than the amplitude of said logic level signals at a prede-

termined internal point in said circuit, a testing circuit comprising:

means for detecting at a first one of said external pins an external signal of predetermined voltage amplitude in excess of any logic level signal normally input thereto;

means responsive to the detection of said external signal for coupling the present amplitude of said high voltage pulse at said internal point to a second one of said external pins; and

means responsive to the absence of said external signal for isolating said internal point from said second external pin so as to enable the normal operation of said integrated circuit.

4,450,403

METHOD AND APPARATUS FOR DETERMINING ROTATIONAL SPEED

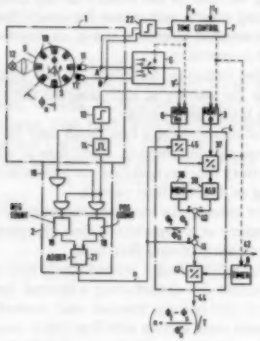
Walter Dreiseitl, Erlangen; Manfred Koch, Bamberg, and Wilhelm Linden, Erlangen-Buechenbach, all of Fed. Rep. of Germany, assignors to Siemens AG, Berlin and Munich, Fed. Rep. of Germany

Filed Feb. 16, 1982, Ser. No. 348,833

Claims priority, application Fed. Rep. of Germany, Mar. 2, 1981, 3107938

Int. Cl.³ G01P *3/48, 3/54*

U.S. Cl. 324—166 **9 Claims**



1. In an apparatus for determining the rotational speed of a rotating member having

a digital tachometer signal generator which produces an angular signal that varies steadily at least section-wise and approximately periodically with the angle of rotation of the rotating member, the respective cycle length of said signal being defined by angular regions traversed by the rotating member between approximately equidistant discrete angular positions defined by the intersection of the angular signal with a reference value, and the instantaneous amplitude of said signal corresponding to the respective instantaneous angle of rotation relative to an adjacent one of the discrete angular positions, and which delivers a counting pulse whenever the instantaneous value of the angular signal is equal to the reference value; and

a counter which counts the number of count pulses delivered within the measurement period for determining the number of said traversed angular regions, the improvement comprising:

an output terminal on said signal generator for delivering the angular signal from the signal generator;

a memory connected to the output terminal to receive and store until the end of the measurement period, in response to an initializing pulse, the amplitude of the angular signal corresponding to the instantaneous angle of rotation of the member at the beginning of the measurement period; and

computation circuitry connected to receive, in response to an end pulse at the end of the measurement period, the amplitude of the angular signal corresponding to the instantaneous angle of rotation of the member at the end of the measurement period and the stored amplitude from the memory, to define a correction factor corresponding to the difference in the instantaneous angles of rotation at the beginning and end of the measurement period, and to compute a corrected total angular displacement based on the counted member of traversed angular regions and the defined correction factor.

4,450,404

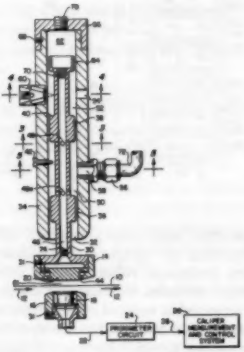
PNEUMATIC SURFACE FOLLOWER WITH NEGATIVE FEEDBACK OF A VARIABLE FORCE COUNTERACTING THE LEVITATING FORCE

Paul Williams, Columbus, and Dan R. Landis, Bexley, both of Ohio, assignors to Accuray Corporation, Columbus, Ohio

Filed Oct. 26, 1981, Ser. No. 315,173

Int. Cl.³ G01B *7/10, 13/04;* G01N *27/72*

U.S. Cl. 324—226 **30 Claims**



1. Gauging apparatus for sheet materials and the like comprising a surface follower body which during a gauging operation is constrained without substantial solid bodily contact and guided for movement along a surface follower path that intersects the path of a traveling sheet to be gauged, the body having a passage which during a gauging operation carries a flow of pressurized gas that is provided by a pressurized gas supply means and which gas is discharged against one surface of the sheet, the discharge of the gas being effective when the body is at a predetermined distance from the surface to generate a levitating force urging the body away from the sheet surface, the gas pressure in the passage being subject to variation as a result of changes in the gas supply and changes in the distance of the surface follower body from the surface,

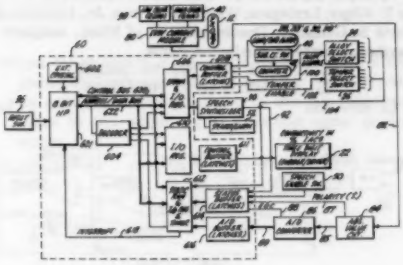
means responsive to the pressure of the gas in the passage for exerting on the body a counteracting force that tends to move the body closer to the surface, the counteracting force increasing when the pressure increases and decreasing when the pressure decreases, and coacting with the levitating force in such a manner that the predetermined distance of the body from the surface is normally maintained substantially constant and is relatively unaffected by minor variations in the pressure of the gas in the passage.

4,450,405

ALLOY TESTING APPARATUS USING EDDY CURRENT CONDUCTIVITY PROBE

Bruce S. Howard, Seattle, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Jul. 14, 1980, Ser. No. 168,625
Int. Cl.³ G01N 27/72; G01R 33/12; G05B 19/02
U.S. Cl. 324—234 14 Claims



5. An apparatus for testing alloy parts by eddy current probing for conductivity, comprising the combination of:

eddy current conductivity measurement means including a probe means for producing an analog signal representing the conductivity of the test part when said probe means is moved into proximity therewith;

analog-to-digital conversion means for receiving said analog signal representing the conductivity of the test part and for converting such analog signal to a digitized conductivity signal;

probe-on-part processor means including threshold means for establishing a predetermined threshold level between a first range of levels of said digitized conductivity signal that exists when said probe means is remote from a test part and a second range of levels of said digitized conductivity signal that exists when said probe means is brought into proximity with a test part, said probe-on-part processor means detecting proximity of said probe means to the test part by sensing a charge in level of said digitized conductivity signal in which such signal crosses said predetermined threshold into said second range of levels;

peak detection processor means, controlled by said probe-on-part processor means, for receiving said digitized conductivity signal and detecting a decreasing level thereof when said probe-on-part processor means has detected proximity of said probe means to the test part; and

data output means responsive to said peak detection processor means for outputting a peak value of conductivity represented by said digitized conductivity signal.

4,450,406

TRIAXIAL OPTICAL FIBER SYSTEM FOR MEASURING MAGNETIC FIELDS

Lloyd C. Bobb, Willow Grove, Pa., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

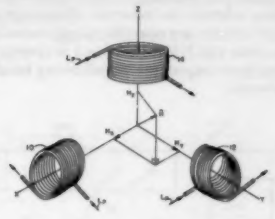
Filed Oct. 5, 1981, Ser. No. 308,310
Int. Cl.³ G01R 33/032; G02F 1/09; G02B 5/172
U.S. Cl. 324—247 15 Claims

1. A system for measuring a single magnetic field, comprising:

a source of polarized light;

three fiber-optic means orthogonally disposed in a triaxial arrangement and optically coupled to said source for propagating the polarized light in three separate orthogonal directions through the field;

photodetector means optically connected to said fiber-optic means for producing a plurality of respective analog signals indicative of characteristic changes caused by the magnetic field in the polarized light propagated in each direction through the field; and



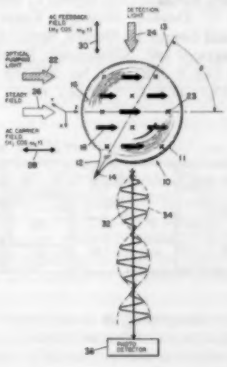
processor means electrically connected to said photodetector means for digitally determining the respective orthogonal components of the magnetic field in the directions of the propagated light.

4,450,407

MAGNETIC RESONANCE CELL AND METHOD FOR ITS FABRICATION

Tae M. Kwon, Thousand Oaks, and William P. Debley, Sepulveda, both of Calif., assignors to Litton Systems, Inc., Beverly Hills, Calif.

Filed Oct. 2, 1981, Ser. No. 307,995
Int. Cl.³ G01R 33/08
U.S. Cl. 324—304 62 Claims



1. A process for treating the inner surface of a magnetic moment gas container to increase the relaxation time constant of aligned magnetic moments of at least one magnetic moment gas contained within, comprising:

(a) coating said inner surface of said magnetic moment gas container with an alkali metal hydride; and

(b) introducing into said container at least one magnetic moment gas selected from the group consisting of xenon-131 and krypton-83.

4,450,408

LOW LOSS WIDE BAND FRONT END FOR NMR RECEIVER

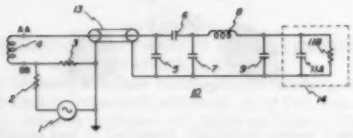
Jerome J. Tiemann, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Dec. 11, 1981, Ser. No. 329,791
Int. Cl.³ G01R 33/08
U.S. Cl. 324—318 6 Claims

1. A low loss, wide band front end for sensing and coupling

an NMR signal to a preamplifier of an NMR imaging receiver comprising:

a multi-pole impedance transforming bandpass network having first and second sets of coupled resonant circuits each formed by respective sets of inductive and capacitive elements, wherein the inductive elements in said first set of resonant circuits are operable simultaneously as a pick-up coil to sense said NMR signal and as operative elements of said multipole impedance transforming bandpass network; and wherein



said second set of resonant circuits is operable to transform the input impedance of said preamplifier to an impedance level which matches the combined resistance of said first set of inductive elements in said first set of resonant circuits more closely than the untransformed input impedance of said preamplifier, wherein the transformed impedance level appears in parallel with said first set of resonant circuits and is operable to broaden the signal bandwidth thereof.

4,450,409

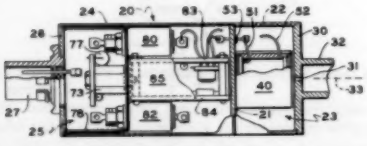
PRESSURE SENSOR AND LEAK DETECTOR

B. Wayne Castleman, Kenneth City; Robert F. Donehoo, Clearwater; Rudolph G. Oswald, Seminole; Kenneth L. Reed, Safety Harbor, and George H. Shipley, Seminole, all of Fla., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Oct. 9, 1981, Ser. No. 310,183

Int. Cl.³ G01N *27/62*; G01T *1/185*

U.S. Cl. 324—460 **1 Claim**



1. A leak detector comprising, in combination:

a housing having an axis and first and second compartments spaced along said axis and hermetically separated by a partition;

means for placing said first compartment in communication with an evacuated space to be monitored for leakage;

an ionization cell in said first compartment producing an electric current determined by gas in said first compartment;

means in said second compartment for performing a control function in accordance with the current supplied by said cell, including a cup shaped shield spaced from and opening away from said partition, a relay mounted in said shield, and feed-through filtering means having first ends extending through the bottom of said cup shield and second ends within said compartment beyond said shield;

and hermetically sealed feed-through means for making electrical connection with said cell through said partition into said second compartment, said partition being of aluminum and said hermetically sealed feed-through means comprising a solderable conductor, a metallic tube surrounding and insulated from said conductor and having a first end portion of stainless steel, a second end portion of aluminum, a solid state diffusion bond joining said end portions, means sealing said first end of said tube to said conductor including a ceramic layer sealed to said conductor and a stainless steel portion sealed to said ceramic layer and welded to said first end portion of said tube, and means welding said second end portion of said tube to said partition to surround an aperture for traversal by said conductor.

4,450,410

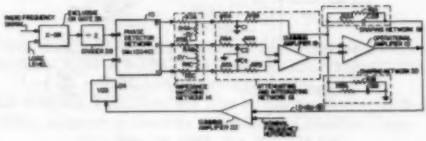
PHASE-LOCK LOOP CONTROL CIRCUITRY

Isaac E. Kliger, Lexington; William C. Brown, Jr., Littleton, and David S. Goldstein, Framingham, all of Mass., assignors to Raytheon Company, Lexington, Mass.

Filed Mar. 3, 1982, Ser. No. 356,698

Int. Cl.³ H03D *13/00*; H03L *7/08*

U.S. Cl. 328—155 **1 Claim**



1. In a control circuit using a charge-pump phase detector coupled to an operational amplifier to produce a bipolar D.C. signal indicative of the phase relationship between a first and a second radio frequency signal, such charge-pump phase detector having first and second inputs and three outputs incorporating a pair of bistable multivibrators actuated by the input signal and the second radio-frequency signal to produce signals designated D, U and $\overline{D}$, where D at said output and U are pulse signals representative of the set states of the bistable multivibrator and $\overline{D}$ is the complement of D, the duty cycles of the signals designated D, U and $\overline{D}$ being indicative of the difference in phase between the input signal and the second radio-frequency signal, the improvement comprising:

(a) frequency divider means coupled with its output to said first input of said detector and responsive to the first radio-frequency signal for producing an input signal for the charge-pump phase detector at a frequency half the frequency of the first radio frequency signal coupled to said second input of said detector;

(b) integrating, attenuating and combining means coupled to said detector outputs and responsive to the signals designated D, U and $\overline{D}$, for producing a bipolar D.C. signal equal to D plus 2U minus $3\overline{D}$; and

(c) means coupled to said bipolar DC input producing means and responsive at least in part to the bipolar D.C. signal, for adjusting the frequency of the second radio-frequency signal into phase coincidence with the frequency of the first radio frequency signal.

4,450,411

AUTOMATIC CALIBRATION SYSTEM FOR SIGNAL AMPLIFIER CIRCUITS

Robert N. Spurr, Englewood, Colo., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Jul. 27, 1982, Ser. No. 402,393

Int. Cl.³ G01R *19/00*

U.S. Cl. 330—2 **19 Claims**

1. A calibration system for signal amplifier circuits comprising

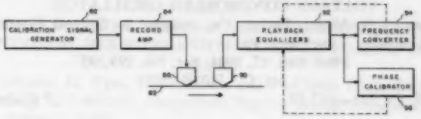
signal generating means for producing a single complex output signal having a plurality of predetermined frequencies at respective preselected amplitudes,

recording means for recording said output signal,

reproducing means for reproducing said recorded output signal,

signal amplifier means having an adjustable gain characteristic for amplifying said reproduced output signal,

frequency conversion means for measuring the frequency components of said amplified output signal corresponding to said predetermined frequencies and



means for providing a correction feedback control for adjusting said gain of said signal amplifier means to produce an amplitude correspondence of said amplified output signal to said output signal from said signal generating means.

4,450,412

BALANCED AMPLIFIER OUTPUT STAGE

Bengt O. Berg, Solna, Sweden, assignor to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

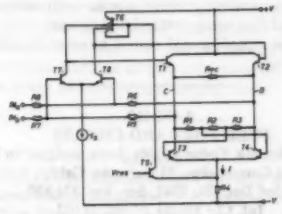
PCT No. PCT/SE80/00114, 371 Date Jan. 4, 1981, 102(e) Date Dec. 23, 1980, PCT Pub. No. WO80/02488, PCT Pub. Date Nov. 13, 1980

PCT Filed Apr. 21, 1980, Ser. No. 227,082

Claims priority, application Sweden, May 4, 1979, 7903931

Int. Cl.³ H03F *3/45, 3/26*

U.S. Cl. 330—255 **6 Claims**



1. A current stabilized balanced amplifier comprising: a source of operating voltage having first and second terminals; first and second output amplifiers connected in parallel, each of said amplifiers comprising first and second transistors with emitter-collector paths serially connected, in each amplifier junction means at junction of the emitter of one of the transistors and the collector of the other transistor; a load connected between said junction means; first connecting terminal means for connecting the collectors of said first transistors to the first terminal of said source of operating voltage; second connecting terminal means for connecting the emitters of said second transistors to the second terminal of said source of operating voltage; one of said connecting terminal means including sensing means for sensing the sum of the current passing through said output amplifiers; regulating means for controlling the current passing through said output amplifiers; and control means including a representation of a reference current and responsive to said sensing means for controlling the operation of said regulating means to control the sum of the current to a given constant value directly related to the value of the referred current and thereby fixing a constant operating point for said output amplifiers.

4,450,413

AUTOMATIC SIGNAL LEVEL CONTROL DEVICE

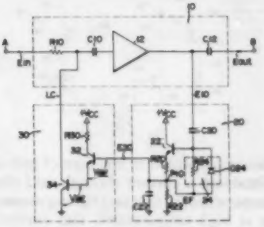
Kenji Fujibayashi, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Feb. 26, 1982, Ser. No. 352,644

Claims priority, application Japan, Mar. 10, 1981, 56-34295; Mar. 10, 1981, 56-34296

Int. Cl.³ H03G *3/30*

U.S. Cl. 330—279 **22 Claims**



2. An automatic signal level control device comprising:

a variable impedance element having a impedance which is varied as a function of the level of control signal applied thereto;

a variable gain circuit coupled to said variable impedance element and providing an output signal with a gain which is varied as a function of the impedance of said variable impedance element; and

detector means coupled to said variable impedance element and to said variable gain circuit, for generating said control signal upon receipt of the output signal from said variable gain circuit;

said detector means comprising:

a bipolar transistor having a base which is supplied with a first signal which is a function of the output signal from said variable gain circuit and an emitter from which there is drawn out a second signal having a potential which is a function of that of said first signal;

a feedback element coupled between the base and emitter of said transistor, said feedback element including:

a PN junction type diode, the base-emitter PN junction of said bipolar transistor being coupled in parallel with the PN junction of said PN junction type diode such that the PN junctions of said bipolar transistor and of said diode are coupled in mutually opposite directions; and

a feedback resistor coupled in parallel with said base-emitter PN junction of said bipolar transistor; and

a capacitor coupled between the emitter of said transistor and a circuit having substantially no AC potential, for storing a charge corresponding to said second signal, a beedback signal corresponding to the charged potential of said capacitor being fed back to the base of said transistor through said feedback element, and wherein said second signal corresponds to said control signal.

4,450,414

HIGH TEMPERATURE CURRENT MIRROR AMPLIFIER

Raymond B. Patterson, III, Melbourne, Fla., assignor to Harris Corporation, Melbourne, Fla.

Filed Feb. 23, 1982, Ser. No. 351,443

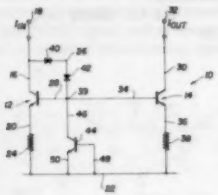
Int. Cl.³ H03F *3/10*

U.S. Cl. 330—288 **7 Claims**

1. In a current mirror amplifier having an input transistor whose collector is connected to its base in a transdiode connection, its emitter connected to a voltage supply terminal and its collector connected to an input terminal and output transistor whose base is connected to the base of said input transistor, its emitter connected to said voltage supply terminal and its col-

lector connected to an output terminal, the improvement comprising:

biasing means in said transdiode connection of said input transistor for producing a voltage to maintain the base-collector junction of said input transistor reversed-biased; and



current means connected to said base of said input transistor for maintaining a current through said biasing means at high temperatures so that said biasing means produces said voltage at high temperatures, said current means being operative above a selected temperature and inoperative below said selected temperature.

4,450,415

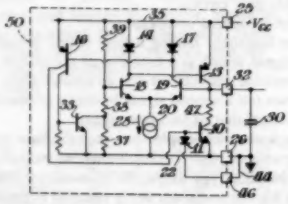
ALTERABLE MODE OSCILLATOR

Walter S. Gontowski, Jr., Thompson, Conn., assignor to Sprague Electric Company, North Adams, Mass.

Filed Aug. 27, 1981, Ser. No. 296,749

Int. Cl.³ H03K *4/04, 5/159, 3/282*

U.S. Cl. 331—111 **2 Claims**



1. An alterable mode oscillator comprising:

a capacitor;

a pair of DC power supply busses;

a charger current-mirror circuit having an output branch connected in a series circuit with said capacitor which series circuit is connected between said pair of DC supply busses;

a discharger current-mirror circuit having a series connected output branch comprising a resistor and an output transistor, said output branch being connected in parallel with said capacitor;

a constant current source means for producing a constant value DC current;

an oscillating switching means for alternately directing said constant current to the input branches of said charger and discharger current-mirror circuits, respectively, so that in a first operating mode, the ratio of the rates of charging to discharging of said capacitor is determined by the magnitude of said current from said constant current source and the area of the paralleled junctions of said current-mirror circuits; and

a mode changing means for disconnecting in said discharging current-mirror circuit the reference p-n junction of said output transistor so that when said constant current is directed to the input branch of said discharger current-mirror circuit, said output transistor is driven harder and the increased rate of discharge of said capacitor tends to be exponential with time constant equal to the RC product of said resistor and capacitor.

4,450,416

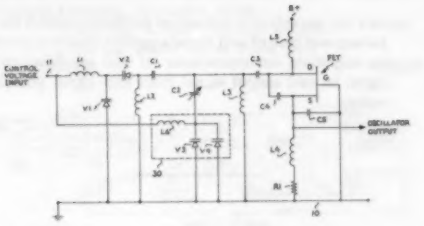
VOLTAGE CONTROLLED OSCILLATOR

Gregory N. Mears, Forest, Va., assignor to General Electric Company, Lynchburg, Va.

Filed Aug. 17, 1981, Ser. No. 293,395

Int. Cl.³ H03B *5/00*

U.S. Cl. 331—117 FE **7 Claims**



1. An improved voltage controlled oscillator comprising:

a. a source of voltage;

b. an active device having electrodes coupled to said source of voltage;

c. a circuit regeneratively coupled to the electrodes of said active device to cause said active device to produce electrical oscillations;

d. a frequency determining circuit comprising at least one capacitor coupled to said active device;

e. a control terminal;

f. a first varactor coupled between said control terminal and said frequency determining circuit;

g. at least one varactor coupled in series with said one capacitor of said frequency determining circuit;

h. and means coupling said conrol terminal to said at least one varactor.

4,450,417

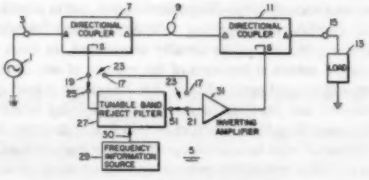
FEED FORWARD CIRCUIT

Andrew F. Folkmann, Cedar Rapids, Iowa, assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Dec. 28, 1981, Ser. No. 334,859

Int. Cl.³ H03H *11/04, 11/02*

U.S. Cl. 333—24 R **15 Claims**



1. An isolation circuit comprising:

a first signal means having first, second and third terminals for providing at said first terminal a signal which is the sum of the signals on said second and third terminals;

amplifier means for amplifying a signal on said second terminal and providing an amplified output; and

second signal means having fourth, fifth and sixth terminals for providing a signal on said sixth terminal which is the difference between a signal on said fourth and fifth terminals, said third terminal being coupled to said fourth ter-

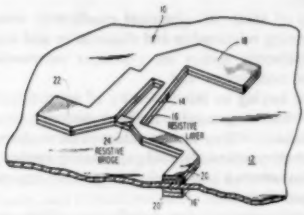
minal and said fifth terminal being coupled to receive said amplified output.

4,450,418

STRIPLINE-TYPE POWER DIVIDER/COMBINER WITH INTEGRAL RESISTOR AND METHOD OF MAKING THE SAME

Lawrence H. Yum, Los Angeles, and Fu-Chuan Chen, Culver City, both of Calif., assignors to Hughes Aircraft Company, El Segundo, Calif.

Filed Dec. 28, 1981, Ser. No. 335,130
Int. Cl.³ H01P 5/12
U.S. Cl. 333—128 11 Claims



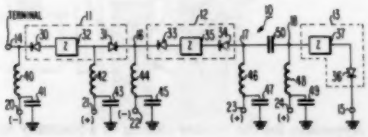
6. A high frequency power divider comprising:
(a) a dielectric substrate;
(b) a first resistive material layer adjacent a first major surface of said substrate; and
(c) a first metal layer, adjacent said first resistive material layer, said first metal layer patterned so as to have a first power input strip commonly connected to a pair of first power output strips, said first resistive material layer being correspondingly patterned and uniformly underlying said first patterned metal layer, said resistive material layer including a first resistive material bridge extending between those portions of said first resistive material layer respectively underlying said output strips.

4,450,419

MONOLITHIC REFLECTION PHASE SHIFTER

Alfred Schwarzmann, Mt Laurel, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Sep. 29, 1982, Ser. No. 428,242
Int. Cl.³ H01P 1/185
U.S. Cl. 333—164 9 Claims



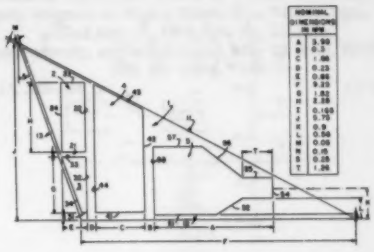
1. A reflection phase shifter comprising:
a plurality of serially-connected fractional phase shifters including at least one transmission-type phase shifter coupled to a reflection-type phase shifter, wherein said at least one transmission-type fractional phase shifter comprises serially-connected PIN diodes and a transforming section and said reflection-type fractional phase shifter comprises a transforming section coupled to a terminated PIN diode; and
means coupled to said fractional phase shifters for applying bias signals to said fractional phase shifters.

4,450,420

SURFACE ACOUSTIC WAVE FILTER

Pol Buckinx, Diepenbeek, Belgium, assignor to GTE Products Corporation, Stamford, Conn.

Filed Jan. 13, 1982, Ser. No. 339,246
Int. Cl.³ H03H 9/64
U.S. Cl. 333—194 10 Claims



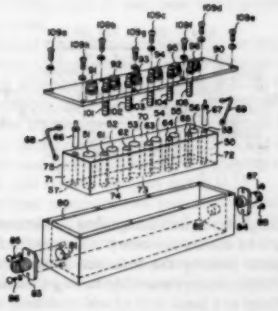
1. In a surface acoustic wave filter comprising an input transducer, an output transducer, a 3db coupler and a reflector, all of the above deposited on the surface of a piezoelectric substrate, the improvement comprising a substrate exhibiting a triangular perimeter, whereby the triangular substrate configuration reduces both the amount of substrate material required and the degree of signal reflection encountered.

4,450,421

DIELECTRIC FILTER

Takeshi Meguro, and Yukio Ito, both of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Jun. 30, 1982, Ser. No. 393,534
Claims priority, application Japan, Jun. 30, 1981, 56-100520
Int. Cl.³ H01P 1/205, 7/00
U.S. Cl. 333—202 9 Claims

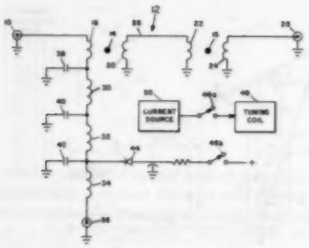


1. A dielectric filter comprising:
a dielectric block;
a plurality of resonator holes made in the dielectric block at predetermined intervals for forming resonators; and
a hole made in the dielectric block between each adjacent pair of the resonator holes, for adjusting the coupling between the resonators, the interior surfaces of the resonator holes and the surface of the dielectric block, except the interior surface of each coupling adjustment hole, being at least partly covered with a conductor layer;
wherein each said coupling adjustment hole is disposed apart from the line joining the centers of the resonator holes.

4,450,422
ELECTRONIC FILTER DEVICES

Larry R. Lockwood, McMinnville, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Sep. 28, 1982, Ser. No. 425,732
Int. Cl.³ H01P 1/218, 1/213
U.S. Cl. 333—202 7 Claims

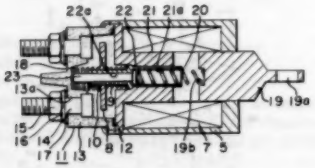


1. An electronic filter device, comprising:
an input connection;
a high frequency section having an input coupling loop connected to said input connection, a gyromagnetic resonance element and a first output connection; and
at least one inductor and at least one capacitor connected to said input coupling loop and forming a low frequency filter section therewith, said low frequency filter section having a second output connection.

4,450,423
MAGNETIC SWITCH

Akira Morishita, Himeji, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 28, 1982, Ser. No. 343,768
Claims priority, application Japan, Feb. 10, 1981, 56-18056[U]
Int. Cl.³ H01H 51/08
U.S. Cl. 335—131 2 Claims



1. In a magnetic switch comprising an electromagnetic coil, a movable iron core, a stationary iron core for forming a part of a magnetic path by the actuation of said electromagnetic coil, a movable contact assembly having a contact at one end which is fitted to a inner hole of said stationary iron core so as to be slidable in the axial direction wherein said contact assembly further includes a movable contact axially facing said stationary iron core to be attractive to said stationary iron core depending upon actuation of said electromagnetic coil, a pair of stationary contacts brought into contact with said movable contact of the movable contact assembly when moved by said movable iron core, and a cap for holding said pair of stationary contacts to provide a contact chamber, an improvement wherein said movable contact assembly further comprises a hollowed movable contact rod and a compressive coil spring placed in said hollowed movable contact rod which has one end contacting an end surface of said movable iron core and the other end operably arranged in said movable contact assembly to bias said movable iron core away from said movable contact assembly.

4,450,424
ELECTRICAL INSULATING SYSTEM

Fred S. Sadler, Jessup, Pa.; Paul F. Hettwer; Vu H. Viet, both of Franksville, Wis., and Clarence R. Acker, Zanesville, Ohio, assignors to McGraw-Edison Company, Rolling Meadows, Ill.

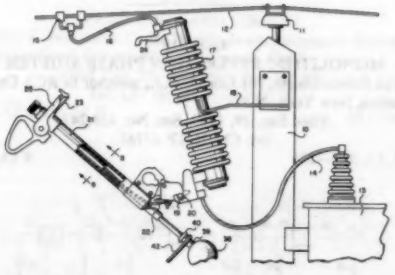
Filed May 10, 1982, Ser. No. 376,525
Int. Cl.³ H01F 27/32; H01B 3/18
U.S. Cl. 336—94 2 Claims

1. A distribution-class transformer, comprising:
a container,
a plurality of sheet-like electrical conductors wound in a transforming relationship and disposed in said container,
a liquid dielectric within the container surrounding said electrical conductors, and
kraft paper having an initial density of approximately 0.80 gm/cm³ and a generally uniform nitrogen content of approximately 4% by weight achieved through impregnation with dicyandiamide, said paper being applied as layer insulation between said conductors and impregnated with said liquid dielectric,
whereby the voltage stress distribution within said kraft paper is more uniformly distributed relative to a kraft paper having an initial density of approximately 0.80 gm/cm³ and not so treated with dicyandiamide.

4,450,425
APPARATUS FOR REMOTE CLOSING OF FUSE CIRCUITS

Donald R. Manning, Susquehanna Ave., Milton, Pa. 17847

Filed Nov. 19, 1980, Ser. No. 208,258
Int. Cl.³ H01H 71/10
U.S. Cl. 337—171 8 Claims



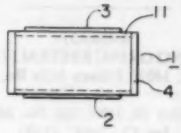
1. Apparatus for the remote closing of a pivotally mounted fuse carrying switch member which member includes a fuse tube carried by an insulating support and latching members for retaining such switch member in operating position which apparatus comprises
a rod,
said rod having a portion for insertion in said fuse tube and a portion extending beyond said fuse tube with a cushioned head thereon, and
an actuating cord connected to said second mentioned rod portion contiguous to said head for moving said apparatus and said switch member for switch member engagement by said latching members.

4,450,426

NONLINEAR RESISTOR AND PROCESS FOR PRODUCING THE SAME

Tadahiko Miyoshi; Takeo Yamazaki; Kunihiro Maeda; Ken Takahashi, all of Hitachi, and Siniti Oowada, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 6, 1981, Ser. No. 251,543
Claims priority, application Japan, Apr. 7, 1980, 55-44606
Int. Cl.³ H01C 7/12
U.S. Cl. 338—21 26 Claims



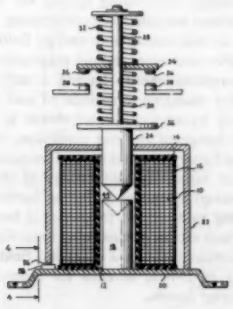
1. A nonlinear resistor comprising a sintered body containing zinc oxide as a major component and at least bismuth oxide and boron oxide, the sintered body having upper and lower surface layers forming the upper and lower surfaces of the sintered body, and at least one electrode formed on at least one of the upper and lower surfaces of the sintered body, characterized in that at least one of the upper and lower surface layers of the sintered body contain a higher γ-form bismuth oxide phase concentration than the inner portion of the sintered body and the periphery portions of the at least one of the upper and lower surface layers have a lower γ-form bismuth oxide phase concentration than the inner portions of the at least one of the upper and lower surface layers.

4,450,427

CONTACTOR WITH FLUX SENSOR

Ronald E. Gareis, Charlottesville, Va., assignor to General Electric Company, Charlottesville, Va.

Filed Dec. 21, 1981, Ser. No. 332,732
Int. Cl.³ H01L 43/04
U.S. Cl. 338—32 H 6 Claims



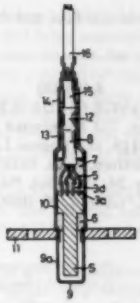
1. An electromagnetic contactor assembly comprising:
a magnetic circuit including a fixed core member, a moveable armature, a variable air gap between said fixed core member and said moveable armature and a fixed air gap in said core member;
an electrically energizable actuating coil arranged for establishing an operating magnetic flux in said core member;
a spring member arranged for biasing said armature in a position wherein said variable air gap is at a maximum; and
a magnetic flux sensor mounted in said fixed air gap for providing an output signal representative of the magnitude of flux in said core member.

4,450,428

GAS DETECTING SENSOR

Minoru Ohta; Yutaka Hattori, both of Okazaki; Tomio Kawakami, Nishio, and Michitosi Onoda, Toyohashi, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Dec. 31, 1981, Ser. No. 336,402
Claims priority, application Japan, May 25, 1981, 56-79708
Int. Cl.³ H01L 7/00
U.S. Cl. 338—34 11 Claims



1. A gas detecting sensor for detecting the partial pressure of oxygen gas contained within exhaust gases, comprising:
a base body made of ceramic material having a characteristic of generating heat when an electric current is supplied thereto;
one pair of electrodes which are fixed to said base body at a predetermined interval, one end of each of said one pair of electrodes being directly fixed to said base body so as to form an electric path crossing said base body therebetween while the other portion of each of said one pair of electrodes being fixed to said base body through a first insulating layer;
a sensing element made of ceramic material having electrical characteristic in response to the partial pressure of oxygen gas, which is closely fixed to said base body through a second insulating layer in the vicinity of said electric path;
another pair of electrodes which are fixed to said base body so as to be electrically insulated therefrom and to be contacted with said sensing element for supplying an electric current to said sensing element; and
two pairs of lead members, one pair of said lead members being connected to said one pair of electrodes for supplying an electric current to said base body while the other pair of said lead members being connected to said another pair of electrodes for supplying an electric current to said sensing element.

4,450,429

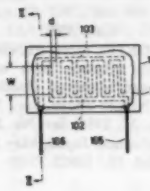
HUMIDITY SENSITIVE RESISTANCE DEVICE

Michihiro Murata, Kyoto, Japan, assignor to Murata Manufacturing Co., Ltd., Japan

Filed Oct. 26, 1982, Ser. No. 436,663
Int. Cl.³ H01L 7/00
U.S. Cl. 338—35 16 Claims

1. A humidity sensitive resistance device wherein a humidity sensitive resistance film is formed on electrodes opposed to each other, and the resistivity of the humidity sensitive resistance film increases with an increase of an ambient relative humidity, characterized in that said humidity sensitive resis-

tance film comprises a hydrophilic polymer and a conductive powder, and has a zirconium compound unevenly distributed



on the side of surface of said film, and the surface of said film being dehydrated.

4,450,430

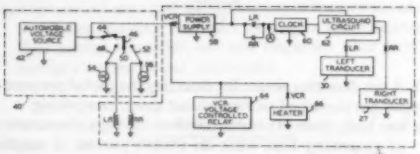
LANE CHANGE GUIDANCE SYSTEM

Boris M. Barishpolsky, 712 Farmington Ave., Apt. 304, West Hartford, Conn. 06119, and Eugene L. Filstein, 178 Brunswick Ave., West Hartford, Conn. 06107

Filed Apr. 24, 1981, Ser. No. 257,120

Int. Cl.³ G08G *1/00*; B60Q *1/34*

U.S. Cl. 340—904 **15 Claims**



1. In an automobile having left and right turn-signal lamps connected by left and right signal lines, respectively, to a manual turn-signal activation device having a neutral state and left-turn and right-turn states in which it applies actuating signals to the left and right signal lamps, respectively, along the left and right signal lines, an ultrasonic object-detection device comprising:

a. ultrasonic signal means selectively operable to transmit ultrasonic pulses into left and right target regions disposed to the left- and right-hand sides of the automobile, respectively, to detect echoes of said pulses from objects in the left and right target regions and to generate electrical echo-reception signals to indicate the reception of ultrasonic echoes, said ultrasonic signal means including means electrically connected for operation upon transmission of actuating signals on said left and right signal lines to transmit ultrasonic pulses that travel through the target regions without reaching the ground and that reach the ground after traveling beyond the target regions, said ultrasonic signal means receiving ultrasonic echoes of said ultrasonic pulses and producing electrical echo-reception signals representing the time of reception of the ultrasonic echoes;

b. alarm means electrically connected for reception of the echo-reception signals from said ultrasonic signal means and operable in response to the echo-reception signals to present an alarm signal to a driver of the automobile, said alarm means including an alarm indication to the driver of the automobile in response to the echo-reception signals only upon application of enablement signals thereto;

c. circuit means electrically connected to the left and right signal lines for detecting actuating signals thereon and operating said ultrasonic signal means to transmit ultrasonic pulses to the left target region when actuating signals are transmitted on the left signal lines and to transmit ultrasonic pulses to the right target region when actuating signals are transmitted on the right signal line, said alarm means thereby notifying the driver of the presence of objects in the right target region during the period of time the turn-signal switching device has been operated to its right-turn state and notifying the driver of the presence of objects in the left target regions during the period of time the turn-signal switching device has been operated to its left-turn state, said circuit means being operable upon movement of said activation device into left-turn and right-turn states and continuing in operation during the time said switching device is in its left-turn and right-turn states.

4,450,431

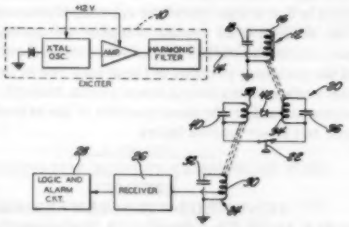
CONDITION MONITORING SYSTEM (TIRE PRESSURE)

Peter A. Hochstein, 14020 Fifteen Mile Rd., Sterling Heights, Mich. 48077

Filed May 26, 1981, Ser. No. 267,258

Int. Cl.³ B60C *23/00*

U.S. Cl. 340—58 **12 Claims**



1. A tire condition monitoring system for monitoring the condition of a wheel mounted tire comprising; exciter means for establishing an electromagnetic energy field having a first frequency, passive converter means responsive to said first frequency for creating energy having a second frequency, sensing means for changing amplitude of said energy at said second frequency by said converter means in response to a predetermined change of the tire condition, receiver means responsible to said energy at said second frequency for providing an indication regarding said energy at said second frequency, said converting means including harmonic multiplier means for making said second frequency a harmonic of said first frequency, said exciter means being inductively coupled to said converter means through a magnetic field, said receiver means including an E-field antenna for receiving an E-field from said converter means.

4,450,432

BINARY MOS PARALLEL COMPARATORS

Friedrich Schmidtpott, Gundelfingen, and Reiner Backes, Freiburg, both of Fed. Rep. of Germany, assignors to ITT Industries, Inc., New York, N.Y.

Filed Aug. 26, 1981, Ser. No. 296,399

Claims priority, application Fed. Rep. of Germany, Sep. 25, 1980, 3036065

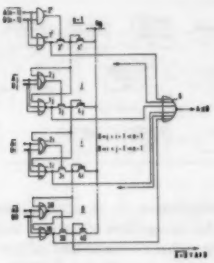
Int. Cl.³ G06F *7/02, 7/04*

U.S. Cl. 340—146.2 **17 Claims**

1. A monolithic integrated binary MOS parallel comparator

using insulated-gate field-effect transistors of the same conductivity type to compare a first n-digit binary word with a second n-digit binary word comprising:

n successively weighted stages each including a NOR block having at least two inputs each receiving a correspondingly weighted digit of a different one of said first and second words, an additional logic circuit receiving said correspondingly weighted digit of said first and second



words, and a transfer transistor and a load transistor connected in series between the output of said NOR block and a supply voltage source, the output of said additional logic circuit being coupled to the gate of said transfer transistor; and

circuit means coupling a first output terminal to at least one of said n stages to provide an output signal for said comparator.

4,450,433

D/A CONVERTING CIRCUIT HAVING TWO D/A CONVERTERS FOR DECODING AND CONVERTING A DIGITAL SIGNAL INTO AN ANALOG SIGNAL

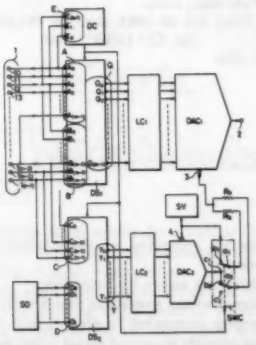
Masaru Moriyama, Yamato, Japan, assignor to Victor Company of Japan, Limited, Yokohama, Japan

Filed Jan. 27, 1982, Ser. No. 343,158

Claims priority, application Japan, Jan. 28, 1981, 56-11167

Int. Cl.³ H03K *13/02*

U.S. Cl. 340—347 DA **6 Claims**



1. A D/A converting circuit comprising:

(a) a decoder responsive to at least two bits of an input digital signal to be converted into an analog signal, one of said two bits being an MSB of said input digital signal, said decoder producing an output signal indicating that the magnitude of an analog signal represented by the input digital signal is greater than a predetermined value or not;

(b) a first data selector controlled by the output signal from said decoder for selecting, as its output data, one of two sets of consecutive bits of said input digital signal, one of said two sets including said MSB and the other including an LSB of said input digital signal;

(c) a first D/A converter having an external reference voltage input terminal, and being responsive to the output data from said first data selector for producing an output analog signal by using a first reference voltage applied to said external reference voltage input terminal;

(d) a digital data generator for producing a predetermined digital data;

(e) a second data selector controlled by said output signal from said decoder for selecting, as its output data, one of a set of consecutive bits of said input digital signal including said LSB, and said predetermined digital data from said digital data generator;

(f) a second D/A converter having an external reference voltage input terminal, and being responsive to the output data from said second data selector for producing an output analog signal by using a second reference voltage applied to said external reference voltage input terminal, said second D/A converter producing a voltage having a specific relationship with respect to said second reference voltage when said predetermined digital data is applied thereto via said second data selector;

(g) a D.C. voltage source for producing a predetermined voltage which is fed to said external reference voltage input terminal of said second D/A converter as said second reference voltage; and

(h) means for producing said first reference voltage fed to said external reference voltage input terminal of said first D/A converter, said means being controlled by said output signal from said decoder for supplying said external reference voltage input terminal of said first D/A converter with the sum of said second reference voltage and the output voltage of said second D/A converter, or only said second reference voltage.

4,450,434

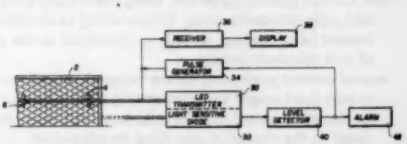
APPARATUS FOR DETERMINING BREAK LOCATIONS IN FENCING

Paul H. Nielsen, Mahomet, and Ray G. McCormack, St. Joseph, both of Ill., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed May 19, 1981, Ser. No. 265,886

Int. Cl.³ G08B *29/00, 13/00*

U.S. Cl. 340—506 **5 Claims**



1. An apparatus for intrusion detection, comprising,

a cable comprising at least one optical fiber having an electrical transmission line running therealong,

means for generating light energy into one end of said at least one optical fiber,

means for receiving said light energy at the other end of said at least one optical fiber,

electrical pulse generator means, responsive to said light energy receiving means, for transmitting electrical pulses into one end of said transmission line, when said optical fiber is broken,

electrical pulse receiver means for receiving said electrical pulses at the same end of said transmission line that said pulses are transmitted into, and

indicator means, responsive to said electrical pulse receiver means and said electrical pulse generator means, for indi-

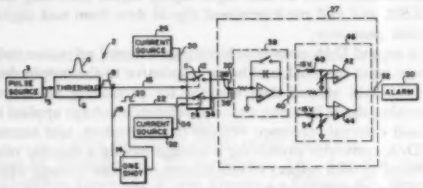
cating the time difference between the time said pulses are transmitted and the time they are received.

4,450,435

ANALOG DEBRIS ALARM

Bobby D. James, 7184 W. 2nd La., Hialeah, Fla. 33014, assignor to Bobby Dencil James, Hialeah, Fla.

Filed Nov. 30, 1981, Ser. No. 325,789
Int. Cl.³ G08B 29/00; G01N 27/00
U.S. Cl. 340—511 9 Claims



1. A debris alarm for use with a particle analyzing apparatus for studying particles in suspension, said apparatus including a particle sensing aperture through which said particles in suspension are passed, means for passing an electric current through said aperture simultaneously with passage of a particle through said aperture, and detecting means responsive to impedance variations for generating a discrete particle pulse with the passage of said particle through said aperture, said debris alarm comprising:

pulse threshold means, being electrically coupled to said detecting means, for generating a threshold pulse for each particle pulse which exceeds a predetermined threshold level, said threshold pulse having a duration which is a function of the width of said particle pulse at said predetermined threshold level;

fixed length pulse generating means, being electrically coupled to said pulse threshold means, for generating a fixed length pulse of predetermined duration substantially corresponding to that of said threshold pulses for normal said particle pulses, said fixed length pulse generating means operative to generate one said fixed length pulse for each said threshold pulse;

first current generating means, being electrically coupled to said pulse threshold means, for providing an electrical first current in an amount directly proportional to the charge of said threshold pulses;

second current generating means, being electrically coupled to said fixed length pulse generating means, for providing an electrical second current in an amount directly proportional to the charge of said fixed length pulses;

current comparing means, including different means, for receiving said first currents and said second currents, for accumulating the electrical charges of said currents and for providing as an output a difference voltage proportional to the difference in the cumulative charges of said first currents and said second currents;

said current comparing means further including window detector means, being electrically coupled to said difference means, for determining when said difference voltage exceeds a positive upper threshold voltage or falls below a negative lower threshold voltage, said upper and lower threshold voltages defining a predetermined comparison window; and

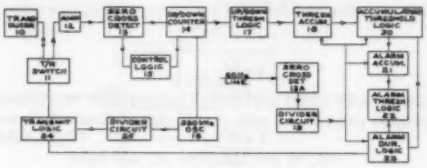
debris indicator means, being electrically coupled to said window detector means, for indicating that said difference voltage has fallen out of said predetermined comparison window.

4,450,436

ACOUSTIC ALARM REPEATER SYSTEM

Donald P. Massa, Cohasset, Mass., assignor to The Stoneleigh Trust, Cohasset, Mass., Fred M. Dellorfano, Jr. and Donald P. Massa, Trustees

Continuation-in-part of Ser. No. 073,309, Sep. 7, 1979, abandoned. This application Sep. 20, 1982, Ser. No. 420,156
Int. Cl.³ G08B 17/00
U.S. Cl. 340—531 25 Claims



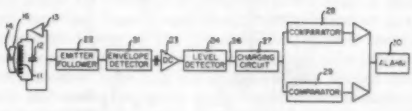
1. In combination in an acoustic alarm repeater system, means for the recognition of a coded audible alarm signal, said coded alarm signal characterized in that the frequency of said signal lies within a specified audible frequency band, and further characterized in that said coded audible signal has a specified repetitive characteristic, and still further characterized in that the average intensity level of said coded alarm signal may vary over a dynamic range greater than 20 dB, said signal recognition means including an electroacoustic transducer for converting said coded audible alarm signal into an electrical signal, means for amplifying said electrical signal, an autocorrelator for detecting the presence of the repetitive characteristic of said coded alarm signal, said autocorrelator characterized in that it produces an output signal when said coded alarm signal is present, means for generating a warning alarm signal, means for activating said warning alarm signal generating means, said activating means responsive to said autocorrelator output signal when it is present.

4,450,437

MOTION ALARM SYSTEM

Eugene Y. Ho, San Carlos, Calif., assignor to Techne Electronics, Ltd., Palo Alto, Calif.

Filed Jul. 10, 1981, Ser. No. 281,957
Int. Cl.³ G08B 21/00
U.S. Cl. 340—540 6 Claims



1. A system for providing an alarm when motion is not sensed comprising

a motion detecting means for providing

a motion signal whose amplitude varies with motion

a level detector connected to receive said output motion signal and provide an output signal when the amplitude of said motion signal is greater than a first amplitude or less than a second amplitude

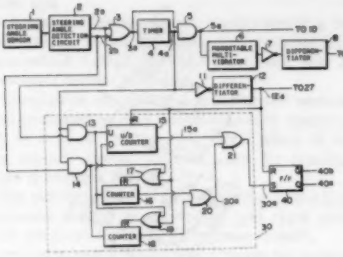
means for receiving the level detector output signal and generating a voltage whose amplitude decreases in the absence of a level detector output signal and means responsive to said voltage for providing an alarm signal when the voltage decreases to a predetermined level due to the absence of a level detector output signal for a predetermined time.

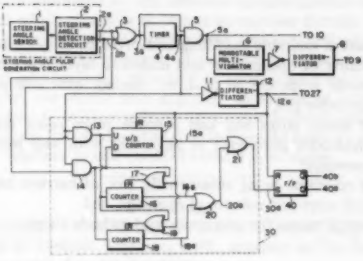
4,450,438

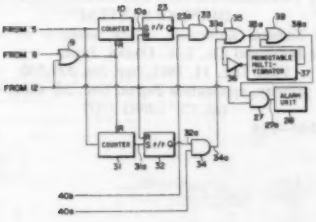
DROWSINESS ALARM SYSTEM FOR A VEHICLE

Yasutoshi Seko, Yokohama; Takayuki Yanagishima, Yokosuka, and Noburu Fukasawa, Kamakura, all of Japan, assignors to Nissan Motor Company, Limited, Kanagawa, Japan

Filed Oct. 5, 1981, Ser. No. 309,012
Claims priority, application Japan, Oct. 6, 1980, 55-139663
Int. Cl.³ G08B 21/00
U.S. Cl. 340—576 **11 Claims**







1. A drowsiness alarm system for a vehicle for producing a warning in the event of driver drowsiness as determined from vehicle steering changes, comprising:

(a) a steering angle pulse generation circuit which produces a clockwise steering angle pulse at one of two output terminals whenever the steering wheel is rotated clockwise through an angle equal to a predetermined angular increment and produces a counterclockwise steering angle pulse at the other output terminal whenever the steering wheel is rotated counterclockwise through an angle equal to the predetermined angular increment;

(b) a first steering angle pulse counting circuit which counts the number of both clockwise and counterclockwise steering angle pulses inputted thereto sequentially to one another within a first predetermined period of time and outputs a first voltage signal whenever the counted number reaches a first predetermined number within a second predetermined period of time;

(c) a second steering angle pulse counting circuit which counts the number of both clockwise and counterclockwise steering angle pulses inputted thereto sequentially to one another within the first predetermined period of time and outputs a second voltage signal whenever the counted number reaches a second predetermined number within the second predetermined period of time;

(d) a curved road detection circuit which counts the number of the clockwise and counterclockwise steering angle pulses, separately, inputted thereto within the second predetermined period of time and outputs a pulse whenever the counted number of either of the clockwise or counterclockwise steering angle pulses inputted thereto reaches a third predetermined number or whenever the difference of the counted numbers between the clockwise and counterclockwise steering angle pulses reaches a fourth predetermined number;

(e) a signal switching circuit, connected between said first and second steering angle pulse counting circuits and said curved road detection circuit, which selectively enables the passage of either of the first or second voltage signals depending on whether said curved road detection circuit sends the output pulse thereto; and

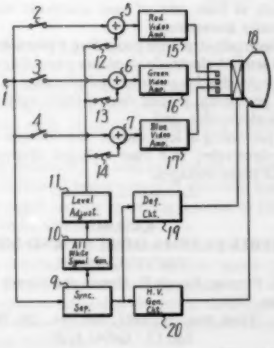
(f) an alarm section which produces an alarm in a predetermined form in response to a pulse received when said signal switching circuit enables the passage of either of the first or second voltage signals.

4,450,439

COLOR VIDEO DATA DISPLAY APPARATUS

Katsumi Kobayashi, Machida, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Nov. 2, 1981, Ser. No. 317,178
Claims priority, application Japan, Nov. 6, 1980, 55-156241
Int. Cl.³ G09G 1/28
U.S. Cl. 340—703 **7 Claims**



1. A display apparatus comprising:

a video signal input terminal supplied with a first video signal to be displayed, said first video signal having a horizontal period and containing a sync signal;

a plurality of video signal amplifiers, each producing an output signal as a primary color signal;

sync signal separating means for separating said sync signal from said first video signal;

signal generating means for receiving said sync signal and generating a second video signal therefrom having a predetermined constant amplitude during said horizontal period;

first means for supplying said first video signal to at least one of said video signal amplifiers;

second means for supplying said second video signal to at least another of said video signal amplifiers; and

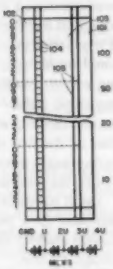
selectively operable summing means for selectively summing said first and second video signals and supplying the summed signal to at least a selected one of said video signal amplifiers.

4,450,440

CONSTRUCTION OF AN EPID BAR GRAPH

Roger P. White, Yonkers, N.Y., assignor to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 24, 1981, Ser. No. 334,110
Int. Cl.³ G09G *3/00*
U.S. Cl. 340—753 **12 Claims**



1. An electrophoretic bar graph display comprising

two separated substrates with at least one substrate being transparent,

an electrophoretic fluid having suspended pigment particles filling the space between said substrates,

a first electrode structure formed on the surface of one of said substrates facing said fluid and a second electrode structure formed on a surface of the other of said substrates facing said fluid with at least one of said electrode structures being substantially transparent,

said first electrode structure providing a plurality of electrodes and said second electrode structure providing an equal number of electrodes for each of said plurality of electrodes,

means for providing at least one of three voltages to each of said first electrodes, and

means for providing at least one of two voltages to each of said second electrodes, said two voltages alternating in value with said three voltages.

4,450,441

DOT MATRIX PLASMA DISPLAY AND METHOD FOR DRIVING SAME

Herman R. Person; Joseph F. Hesse, and Steven R. Hall, all of Columbus, Nebr.

Filed Aug. 27, 1981, Ser. No. 296,790
Int. Cl.³ G09G *3/28*
U.S. Cl. 340—773 **4 Claims**

1. A direct current dot matrix digital display device comprising:

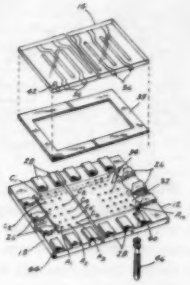
a dielectric substrate having a flat upper surface,

a plurality of elongated cathode strips mounted on the upper surface of said substrate and being arranged in parallel spaced relation to one another,

a printed dielectric layer on said substrate and said cathode strips and having a plurality of openings therethrough each communicating with a portion of said cathode strips, said openings being formed in rows and columns to form a matrix, and rows of openings each being aligned over one of said cathod strips,

a transparent top plate having an under surface and sealed to the perimeter of said substrate by sealing means and positioned above and in spaced relation to said dielectric layer to create an envelope of space above, in communication with, and completely enveloping said matrix of openings;

a plurality of elongated anode strips mounted on the undersurface of said top plate within said envelope of space and in spaced relation to said dielectric layer, said anode strips extending perpendicular to and above said cathode strips and each being spaced above and in registered alignment with one of said columns in said matrix of openings in said dielectric layer,



a mass of ionizable gas filling said envelope of space and said matrix of openings in said dielectric layer whereby said anode strips are all in direct contact with said mass of ionizable gas,

said anode strips and said cathode strips being the only electrodes positioned in alignment with said matrix of openings,

said envelope being substantially free of barriers between said rows and column of openings, and

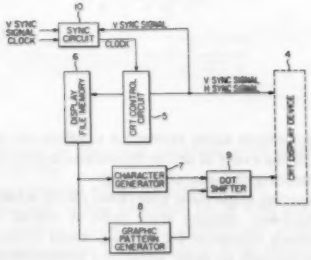
terminal means for said anode and cathode strips.

4,450,442

DISPLAY PROCESSOR FOR SUPERIMPOSED-PICTURE DISPLAY SYSTEM

Kazuyuki Tanaka, Kanagawa, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Dec. 11, 1981, Ser. No. 329,740
Claims priority, application Japan, Dec. 26, 1980, 55-186399
Int. Cl.³ G09G *1/00*
U.S. Cl. 340—814 **3 Claims**



1. In a superimposed-picture display system for displaying a plurality of pictures in a mutually superimposed relationship, a plurality of display processors for generating display signals for displaying said plurality of pictures, respectively, each display processor being of the type comprising:

(a) a display file memory with a storage capacity capable of storing one of at least one display file of character information and graphic patterns, which can be displayed as

one frame on the screen of a raster-display type cathode-ray tube, and

(b) a cathode-ray-tube control circuit which divides the frequency of a clock pulse which is supplied from another display processor to generate

(i) address signals which in turn are delivered to said display file memory so that each of said address signals specifies a memory location in which is stored video information to be displayed at a predetermined location on the screen of said raster-display type cathode-ray tube, and

(ii) vertical and horizontal sync signals which in turn are delivered to said raster-display type cathode-ray tube,

characterized by the provision that each said display processor further comprises:

(A) a comparator circuit for comparing the vertical sync signal generated by said cathode-ray-tube control circuit with an external vertical sync signal which is supplied from another display processor, and for producing an output in response thereto,

(B) a first memory means which stores the output from said comparator means in response to said clock pulse and which produces an output in response thereto,

(C) a second memory means which stores the output from said first memory means in response to the vertical sync signal generated by said cathode-ray-tube control circuit and which produces an output in response thereto,

(D) a two-input AND gate having one input of which is supplied with the output of said second memory means and another input of which is applied with said clock pulse, the AND gate applying an output in response thereto to said cathode-ray-tube control circuit, and

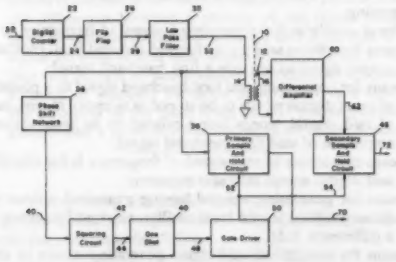
(E) means for resetting said first and second memory means in response to said external vertical sync signal.

4,450,443

POSITION TRANSDUCER FOR DIGITAL SYSTEMS

Carlisle R. Dolland, Torrance, Calif., assignor to The Garrett Corporation, Los Angeles, Calif.

Filed Mar. 18, 1982, Ser. No. 359,349
Int. Cl.³ G08C *19/06*; G01B *7/14*
U.S. Cl. 340—870.36 **23 Claims**



1. Position transducer apparatus for indicating the position of a displaceable core means of a linear variable differential transformer comprising

primary means producing a primary waveform,

secondary means producing a secondary waveform,

displaceable core means for causing attenuation in the secondary waveform in direct proportion to the displacement thereof,

means for generating pulse signals at a predetermined frequency,

filter means for receiving said pulse signals and producing sinusoidal signals for input to the primary means,

phase shift means for receiving said sinusoidal signals to produce a predetermined phase shifted output,

means including a one shot for receiving said phase shifted output and producing gate timing signals,

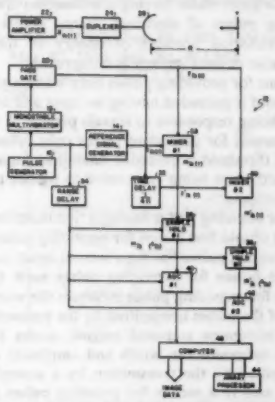
primary and secondary sample and hold means receiving signals from said primary and secondary means, respectively, as a first input and said gate timing signals as a second input to produce DC level outputs proportional to the primary and secondary waveforms, respectively.

4,450,444

STEPPED FREQUENCY RADAR TARGET IMAGING

Donald R. Wehner, and Michael J. Prickett, both of San Diego, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 29, 1981, Ser. No. 268,501
Int. Cl.³ G01S *9/00*
U.S. Cl. 343—5 CM **9 Claims**



1. A device for enabling radar target imaging comprising:

a pulse generator for generating a series of pulses;

first means connected to said pulse generator for generating a series of N identical signal bursts, each burst comprising n pulses and each of said n pulses being a different frequency;

second means connected to said first means for transmitting at least a portion of said series of N identical signal bursts as a radar signal and for receiving a series of radar echos from said radar signal;

third means connected to said second means for separating said series of radar echos into n in-phase and n quadrature phase components for each of said N bursts;

means connected to said third means for sampling and holding said n in-phase and n quadrature phase components for each of said N bursts;

fourth means connected to said sampling and holding means for converting said n in-phase and n quadrature phase components for each of said N bursts to a digital format;

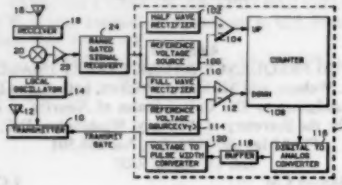
fifth means connected to said fourth means for calculating and storing the relative amplitude of each of said echos, for calculating and storing the phase of each of said radar echos relative to the phase of the corresponding one of said n transmitted pulses for each of said N bursts, for calculating and storing the n element inverse Fourier Transform of each set of n echo signals resulting from each of said N bursts to thereby generate an n×N inverse Fourier Transform array having n range cells for each of said N bursts, and for calculating and storing the N element Fourier transform of each of said n range cells.

4,450,445

RANGE RATE DEPENDENT PULSE CONTROL APPARATUS AND METHOD THEREFOR

Leo B. Conner, Jr., Phoenix, and Robert N. Nelson, Scottsdale, both of Ariz., assignors to Motorola Inc., Schaumburg, Ill.

Filed Sep. 25, 1981, Ser. No. 305,562
Int. Cl.³ G01S 9/02
U.S. Cl. 343—7.5 **12 Claims**



1. In a Doppler radar having a transmitter for periodically transmitting pulses of electrical energy and a receiver for receiving reflected portions of energy of the transmitted pulses, a pulse control apparatus comprising:

first means for providing pulses only when a predetermined threshold is exceeded having an input and an output, said input being responsive to signals present in the receiver;

second means for providing pulses only when a predetermined threshold is exceeded having an input and an output, said input being responsive to signals present in the receiver; and

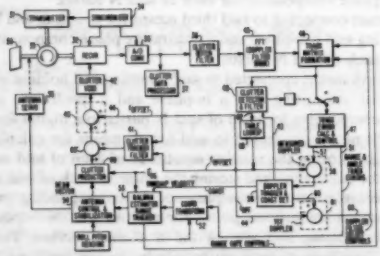
means for counting pulses having a first input coupled to said output of said first means for providing pulses, said means for counting pulses having a second input coupled to said second means for providing pulses such that said first means for providing pulses increases the width and amplitude of the pulses transmitted by the transmitter by a first fixed increment and said second means for providing pulses decreases the width and amplitude of the pulses transmitted by the transmitter, by a second fixed increment, said first means for counting pulses providing an output for determining the width and amplitude of pulses transmitted by the transmitter.

4,450,446

METHOD AND SYSTEM FOR TRACKING TARGETS IN A PULSE DOPPLER RADAR SYSTEM

Steven J. Clancy, Elkridge, and Robert A. Phillips, Crownsville, both of Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 29, 1981, Ser. No. 268,545
Int. Cl.³ G01J 13/32
U.S. Cl. 343—7.7 **7 Claims**



1. A method of continuing the tracking of targets in a pulse doppler radar system having a clutter notch filter and a tracking filter matrix, at times when the doppler frequency of the target approximates the doppler frequency of clutter, comprising

eliminating the rejection effect of the clutter notch filter on received echo signals at said times to not reject the clutter or the target signals,

providing a threshold value for the received unrejected echo signals,

comparing the amplitude of the received unrejected echo signals having selected ranges and doppler frequencies approximating the doppler frequency of the target with the threshold value, and

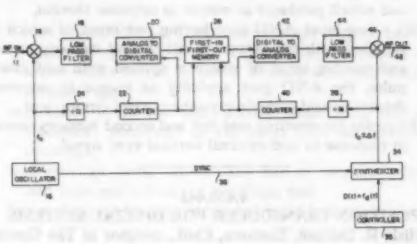
continuing the tracking of the target in accordance with the amplitude comparison of the unrejected target and clutter signals.

4,450,447

SYNTHETIC APERTURE RADAR TARGET SIMULATOR

Howard A. Zebker, Palo Alto; Daniel N. Held, Altadena; Richard M. Goldstein, and Thomas C. Bickler, both of La Canada, all of Calif., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Jul. 17, 1981, Ser. No. 284,287
Int. Cl.³ G01S 7/40
U.S. Cl. 343—17.7 **5 Claims**



1. A synthetic aperture radar target simulator for altering the frequency and time delay of an input rf signal by an amount related to range curvature information and Doppler frequency information associated with a simulated target, said simulator comprising:

a local oscillator for generating a signal of frequency f_o;

means for mixing said input rf signal and said local oscillator output signal to provide a first baseband signal;

means for converting said first baseband signal to a plurality of input digital words to be stored in memory means, each of said digital words being related to an instantaneous amplitude of said first baseband signal;

means responsive to said signal of frequency f_o for clocking said digital words into said memory;

means for generating a signal having a nominal output frequency related to said local oscillator output frequency by a difference $\pm\Delta f$;

means for controlling said signal generating means to alter said nominal output frequency by an amount related to the instantaneous range and Doppler shift of a simulated target;

means for accessing each of said plurality of input digital words stored in said memory means at a rate related to said altered nominal output frequency, said digital words being accessed on a first-in first-out basis;

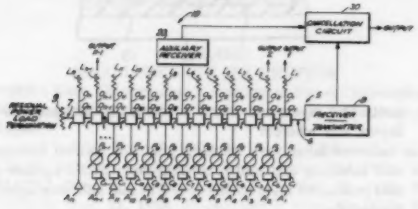
means for converting said accessed memory means digital output words to an analog second baseband signal; and

means for mixing said second baseband signal and said nominal output signal to provide an output rf signal that simulates a return signal that has frequency characteristics related to both range curvature information and Doppler information that would be contained in a return signal from an actual target.

4,450,448
APPARATUS AND METHOD FOR IMPROVING ANTENNA SIDELOBE CANCELLATION

Victor J. Albanese, Valley Stream, and Charles J. Schmidt, Islip, both of N.Y., assignors to Grumman Aerospace Corporation, New York, N.Y.

Filed Aug. 28, 1981, Ser. No. 297,181
Int. Cl.³ G01S 3/16, 3/28
U.S. Cl. 343—379 9 Claims



1. An electronically scannable array antenna comprising n individual antenna elements;

feed means for feeding said antenna elements in series, said feed means having an input end portion adjacent the first antenna element and a load termination end portion adjacent said n^{th} antenna element;

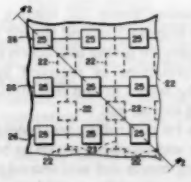
phase shifter means connected to each antenna element; and

a plurality of directional coupler means, each being responsive to one of said antenna elements and the portion of said feed means disposed between said one antenna element and the antenna element adjacent thereto, closest to said load termination end portion of said feed means and having a first port for providing a first output signal for forming a primary radiation pattern having a main beam and sidelobes, said first output signal being defined in the receive operation of the antenna by the sum of a portion of the signal flowing through its associated antenna element and the signal flowing in said feed means from said load termination end portion to said respective directional coupler, at least one of said directional coupler means having a second port for providing a second output signal which is defined in the receive operation of the antenna by the difference between a portion of the signal received from its associated antenna element and a portion of the signal flowing in said feed means from said load termination end portion to said respective directional coupler for forming an auxiliary radiation pattern having a notch in the direction of the main beam of said primary radiation pattern and a relatively flat output in all other directions.

4,450,449
PATCH ARRAY ANTENNA

Harold S. Jewitt, Hennepin County, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Feb. 25, 1982, Ser. No. 352,490
Int. Cl.³ H01Q 1/38
U.S. Cl. 343—700 MS 6 Claims



1. An antenna comprising, in combination:

a first nonconductive substrate;

a conductive ground plane on one surface of said substrate;

a plurality of conductive patches mutually spaced in an array extending over the other surface of said substrate;

means for conductively energizing said patches to comprise a first antenna with said ground plane;

a second nonconductive substrate overlying said plurality of patches;

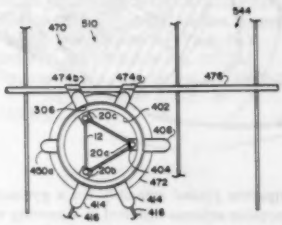
a second plurality of conductive patches mutually spaced in a second array extending over the outer surface of said second substrate, and positioned in the spaces between the patches of said first array;

and means for conductively energizing said second plurality of patches to comprise a second antenna with said ground plane.

4,450,450
ANTENNA TOWER ASSEMBLY

Gary L. Ellingson, Thief River Falls, Minn., and Wendell E. Miller, Warsaw, Ind., assignors to Polar Research, Inc., Thief River Falls, Minn.

Division of Ser. No. 272,313, Jun. 10, 1981. This application Mar. 23, 1983, Ser. No. 477,983
Int. Cl.³ H01Q 3/02
U.S. Cl. 343—758 14 Claims



1. A tower and rotationally positionable mount assembly (538, 542, or 544) which comprises a tower (12) having three vertically-disposed tower legs (20*a*–20*c*), having bracing (22) intermediate of adjacent pairs of said legs that defines a plurality of faces (534*a*–534*c*) of said tower, and having a neutral axis (26) that is disposed intermediate of said faces;

first mounting portion means (170+204, or 402) for operative attachment to one of said faces of said tower;

second mounting portion means (142, 406, or 472), having a tower-receiving opening (548), and having said tower inside said tower-receiving opening, for circumscribing all of said tower legs, for being rotationally positioned around said tower, and for mounting a device thereto;

one (142 or 402) of said mounting portion means comprises first (152 or 432) and second (154 or 434) circumferential surfaces being circumferentially disposed around a second axis (24) that is substantially parallel to said neutral axis, and circumscribing all of said tower legs;

a plurality of roller shafts (182, 188, 218, or 310) being disposed radially outward from said second axis, being spaced circumferentially around said second axis, and being operatively attached to said other (170+204, 406, or 472) mounting portion means;

a plurality of rollers (160, 186, 219, or 308) being operatively attached to said roller shafts, and having roller surface means (162+164, 194+196, or 320) for cooperating with said first circumferential surface;

attaching means, comprising said rollers, and comprising both of said circumferential surfaces, for supportingly attaching said second mounting portion means to said first mounting portion means by operative engagement of said roller surface means with said first circumferential surface, for permitting said second mounting portion means

to be rotationally positioned about said second axis, for vertically restraining said second mounting portion means, and for radially guiding said second mounting portion means; and

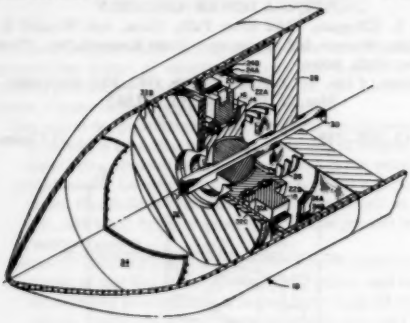
rotational positioning means for rotationally positioning said second mounting portion means with respect to said first mounting portion means.

4,450,451

GIMBAL ASSEMBLY FOR MONOPULSE RADAR ANTENNA

Richard R. La Torre, Bedford, and Robert A. Phaneuf, Chelmsford, both of Mass., assignors to Raytheon Company, Lexington, Mass.

Filed Mar. 3, 1982, Ser. No. 356,697
Int. Cl.³ H01Q *3/02, 1/28*
U.S. Cl. 343—765 **3 Claims**



1. A tripartite gimbal assembly for a gyroscopically stabilized monopulse antenna installed in a moving vehicle having a longitudinal axis, such assembly comprising:

(a) an innermost section affixed to the moving vehicle, such section including a spherical bearing centered at a point on the longitudinal axis of such vehicle;

(b) a central section, generally annular in shape, having an inner surface matching the spherical bearing;

(c) an outermost section rotatably mounted on the central section;

(d) means for rotating the outermost section to gyroscopically stabilize such section and the central section;

(e) means for precessing the outermost section thereby to gimbal the central section on the innermost section;

(f) means, connected between the moving vehicle and the central section, for preventing rotation of the central section and for allowing such section to gimbal on the innermost section; and

(g) means for mounting a reflector for the monopulse antenna on the central section.

4,450,452

DATA RECORDING MEDIUM

Hideo Ando, Tokyo; Toshiharu Nakagawa, Yokohama, and Yoshinori Fujimori, Kawasaki, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Feb. 1, 1982, Ser. No. 344,713
Claims priority, application Japan, Feb. 5, 1981, 56-14981
Int. Cl.³ G01D *15/34*
U.S. Cl. 346—135.1 **9 Claims**

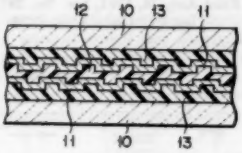
1. A medium capable of recording and reproducing data comprising:

a pair of disc-shaped substrates opposing each other at a distance;

a radiation-sensitive recording layer having a thickness of less than 5,000 Å formed on an opposing surface of each of said substrates, optical data having not yet been recorded in said recording layer;

a protective layer formed on each of said recording layers; and

an adhesive layer which fills a space defined between said



protective layers and which is bonded to said protective layers, and wherein

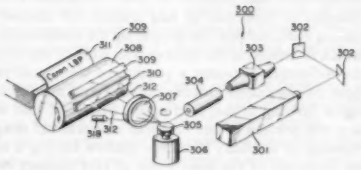
an indented layer with tracking guides is formed between said substrate and said recording layer and a surface of said protective layer to be bonded to said adhesive layer is formed flat.

4,450,453

OVERLAY RECORDING DEVICE FOR RECORDING A PLURALITY OF INFORMATION IN SUPERIMPOSITION

Takashi Kitamura, Yokohama; Asao Watanabe, Higashikurume; Takashi Nakano, Yokohama; Katsumi Masaki, Kodaira; Kazuhiro Hirayama, Yokohama; Yasushi Sato, Kawasaki, and Taisuke Tokiwa, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 831,919, Sep. 9, 1977, Pat. No. 4,232,954, which is a division of Ser. No. 616,675, Sep. 25, 1975, Pat. No. 4,059,833. This application Jul. 2, 1980, Ser. No. 164,524
Claims priority, application Japan, Feb. 3, 1975, 50-14544; Feb. 4, 1975, 50-14530; Feb. 4, 1975, 50-14534; Feb. 13, 1975, 50-18528; Mar. 1, 1975, 50-25120
Int. Cl.³ B41B *15/00*
U.S. Cl. 346—108 **11 Claims**



1. An overlay recording device for recording a plurality of informations in superimposition, said device comprising:

A. means for receiving recording informations for recording purposes, including:

(a) first storing means, in which first information is stored;

(b) first reading means for reading out said first information from said first storing means;

(c) second storing means, in which second information is stored; and

(d) second reading means for reading out said second information from said second storing means;

B. instruction means for giving instruction as to whether said recording informations as received by said receiving means are to be stored in said first storing means or said second storing means; and

C. control means for controlling said recording informations as received by said receiving means to be stored in one of said first storing means and said second storing means, on the basis of instructions from said instruction means, said control means further including:

(a) drive means for driving said first and second reading means synchronously;

(b) recording means for dot-recording informations as read out from said first and second storing means; and

(c) means for applying said first and said second informations corresponding to certain dots onto said recording means by synthesizing said first and said second informations, when said certain dots are to be recorded by said recording means.

4,450,454

SMALL SIZE INK JET PRINTER

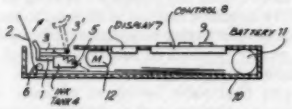
Haruhiko Koto, Shiojiri, Japan, assignor to Epson Corporation, Nagano and Kabushiki Kaisha Suwa Seikosha, Tokyo, both of, Japan

Filed Nov. 19, 1981, Ser. No. 323,008

Claims priority, application Japan, Nov. 20, 1980, 55-166517[U]; Nov. 20, 1980, 55-166518[U]; Nov. 21, 1980, 55-167247[U]; Nov. 21, 1980, 55-167250[U]; May 12, 1981, 56-68317[U]

Int. Cl.³ G01D *15/18*

U.S. Cl. 346—140 R **14 Claims**



1. In a small printer device having an ink jet print head of the ink-on-demand type including a nozzle, the improvement therein comprising:

nozzle cover means for pressing against and blocking the discharge opening of said nozzle;

means for moving said nozzle cover means between a first position and a second position, said nozzle being blocked by said nozzle cover means in said first position and being unobstructed by said nozzle cover means in said second position;

a timer, said timer being in circuit with said print head and adapted to commence operation after printing is completed and to generate a signal after a preselected interval of time;

at least one supplemental function, said at least one supplemental function, when enabled, being subject to performance upon ocurrence of said timer signal; and

means for enabling said at least one supplemental function, said means for enabling cooperating with said nozzle cover means, said at least one supplemental function being enabled only when said nozzle cover means is in said second position.

4,450,455

INK JET HEAD

Hiroshi Sugitani, Machida; Masakazu Ozawa; Hiroto Matsuda, both of Yokohama; Masami Ikeda, Chiba, and Haruyuki Matsumoto, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

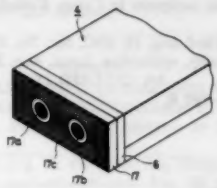
Filed May 28, 1982, Ser. No. 383,099

Claims priority, application Japan, Jun. 18, 1981, 56-94881; Jun. 18, 1981, 56-94882

Int. Cl.³ G01Q *15/16*

U.S. Cl. 346—140 R **7 Claims**

6. An ink jet head comprising an orifice plate made of a hardened film of a photosensitive resin and having an orifice which extends therethrough in the direction of its thickness, wherein on a surface of said plate at least the periphery of said



orifice has a smooth surface, with other regions of the surface being of a rough surface.

4,450,456

CASSETTE COMPRISING A CAPPING DEVICE AND A CLEANING DEVICE FOR AN INK JET PRINTER

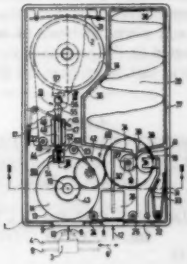
Gerd Jekel, and Franz Obenaus, both of Vienna, Austria, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 28, 1982, Ser. No. 393,203

Claims priority, application Austria, Jul. 21, 1981, 3220/81

Int. Cl.³ G01D *15/18*

U.S. Cl. 346—140 R **5 Claims**

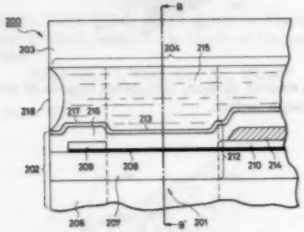


1. A cassette comprising a capping device and a cleaning device for the capping and cleaning, respectively, of the jet nozzle surface (8) of a printing head (3) of an ink jet printer, said capping device comprising a drivable capping cushion (14) having an endless surface (13) and means for passing said endless surface (13) of said capping cushion (14) along a capping position (10) accessible through a window (9) in a wall (7) of said cassette, said cleaning device comprising a drivable cleaning tape (17), driving means for unwinding said cleaning tape (17) from a feed reel (16), for passing said cleaning tape (17) along a cleaning position (12) accessible through a window (17) in said wall (7) and for passing said cleaning tape (17) along a part of the surface (17) of said capping cushion (14) in order to remove contaminations from said surface (13), characterized in that said driving means comprises two rotatably journalled rollers (18, 19) cooperating at their circumferences to drive said cleaning tape (17), passing between and contacting said cooperating circumferences, from said feed reel (16), first along a part of the surface (13) of said capping cushion (14), subsequently through the cleaning position (12) to said rollers (18, 19) and then to a storage space (20) formed in said cassette and wherein one of said rollers (18, 19) may be coupled to a drive device of said ink jet printer.

4,450,457
LIQUID-JET RECORDING HEAD

Takeshi Miyachi, Yokohama; Hisanori Tsuda, Tokorozawa; Toshitami Hara, Tokyo, and Yukio Kasugayama, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 19, 1982, Ser. No. 409,504
Claims priority, application Japan, Aug. 24, 1981, 56-132477
Int. Cl.³ G01D *15/18*
U.S. Cl. 346—140 R 7 Claims

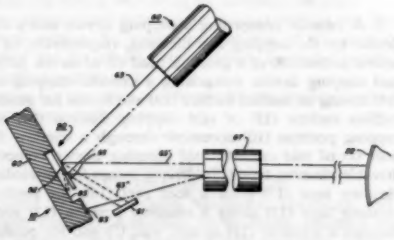


1. A liquid-jet recording head provided with a liquid ejecting section comprising a liquid flow path communicating with an orifice of said liquid ejection section for ejecting a liquid to form flying droplets and having as a portion thereof a heat action zone where thermal energy for forming said droplets acts on the liquid and with an electro-thermal transducer comprising at least one pair of opposing electrodes electrically connecting to a heat-generating resistance layer formed on a base plate and a heat generating part formed between the electrodes, characterized by said electro-thermal transducer having a protective layer composed of a first layer of an organic material and a second layer of an inorganic material which are laminated on the portion of the electrode under the liquid flow path in that order from the electrode.

4,450,458
MULTI-FUNCTION REPRODUCTION APPARATUS

Mehdi N. Araghi, West Webster, and Joseph J. Daniele, Pittsford, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Jul. 2, 1982, Ser. No. 394,602
Int. Cl.³ G01D *15/14*
U.S. Cl. 346—155 7 Claims

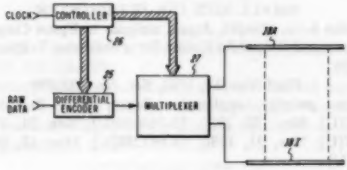


1. A combined read/write micro-deflector array comprising:
(a) a substrate;
(b) a linear succession of bendable reflecting fingers on said substrate interposable in the path of a sheet of light, said fingers being selectively deflected in a pattern commensurate with a line of image signals applied thereto to either reflect light along a first image producing path or along a second path to a stop; and
(c) a linear succession of photosensors on said substrate opposite and parallel to said fingers for converting image rays striking said photosensors to image signals.

4,450,459
DIFFERENTIAL ENCODING FOR FRINGE FIELD RESPONSIVE ELECTRO-OPTIC LINE PRINTERS

William D. Turner, San Marino, and Robert A. Sprague, Saratoga, both of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Sep. 17, 1980, Ser. No. 187,916
Int. Cl.³ G01D *15/14*
U.S. Cl. 346—160 10 Claims

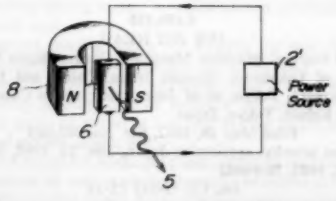


1. In an electro-optic line printer for printing an image on a photosensitive recording medium in response to successive sets of input data samples having magnitudes representing exposure values for picture elements on successive lines of said image, the combination comprising,
a multi-gate light valve having an optically transmissive electro-optic element and a plurality of spaced apart, individually addressable electrodes, said electrodes being disposed on one side of said electro-optic element and being intimately coupled thereto;
means for transmitting a sheet-like, collimated light beam through an interaction region of said electro-optic element;
encoding means for differentially encoding said input samples to provide differentially encoded data samples sample-to-sample voltage drops corresponding to the magnitudes of respective input data samples; and
means coupled between said encoding means and said electrodes for applying said encoded samples to said electrodes, thereby creating successive electric fringe field patterns within the interaction region of said electro-optic element for sequentially spatially modulating said light beam in accordance with the input data samples for successive lines of said image.

4,450,460
MAGNETIC-INFRARED-EMITTING DIODE

Takeshi Morimoto, Kyoto, Japan, assignor to Kyoto University, Kyoto, Japan

Filed Sep. 24, 1981, Ser. No. 305,218
Claims priority, application Japan, Sep. 25, 1980, 55-132279
Int. Cl.³ H01L *33/00*
U.S. Cl. 357—17 10 Claims



1. A magneto-infrared-emitting diode formed of a plate of an

intrinsic semiconductor having a narrow energy gap which does not exceed substantially 0.6 eV, said semiconductor being equipped with no injection electrode and including:

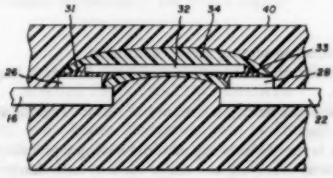
a magnet for applying a magnetic field upon said magneto-infrared-emitting diode in parallel with said plate, and

a current source for supplying a current to said magneto-infrared-emitting diode in parallel with said plate as well as orthogonal to said magnetic field so as to emit an infrared radiation of a wavelength greater than 2.1 μm from said magneto-infrared-emitting diode substantially perpendicular to said plate at least at room temperature.

4,450,461
LOW COST HIGH ISOLATION VOLTAGE OPTOCOUPLER WITH IMPROVED LIGHT TRANSMISSIVITY

James S. Cook, Tully, N.Y., and J. Anthony Lennon, Newry, Northern Ireland, assignors to General Electric Company, Syracuse, N.Y.

Filed Jul. 24, 1981, Ser. No. 286,628
Int. Cl.³ H01L *33/00, 31/12, 23/26;* **G02B** *5/14*
U.S. Cl. 357—19 **1 Claim**



1. A semiconductor optocoupler comprising

an electrically insulative supporting substrate on which is situated first and second finger-like terminals having inner ends confronting each other in spaced relation across an expanse of said substrate,

an emitter responsive to an electrical input signal to generate a light output signal and mounted on one of said terminals adjacent its inner end;

a detector responsive to said light output signal to generate an electrical output signal and mounted on the other of said terminals adjacent its inner end, said detector being spaced apart from said emitter by at least the spacing of the inner ends of said terminals to provide electrical isolation therebetween;

a rod-shaped optically transmissive dielectrical member of glass having a transverse sectional area approximately that of said emitter and detector and having a flat bottom face at one end mounted on and supported by said emitter and in light receiving relation with said emitter, said rod-shaped member having a flat bottom face at its other end mounted on and supported by said detector and in light transmitting relation with said detector, said rod-shaped member spanning the gap across said substrate between the emitter and detector and being operative to optically couple light from said emitter to said detector while maintaining electrical isolation therebetween;

a first layer of optically transmissive coupling material disposed between said emitter and said one end of said rod-shaped member and operative to enhance the coupling of said light output signal from said emitter to said one end, and a second layer of optically transmissive coupling material disposed between said detector and the other end of said rod-shaped member and operative to enhance the coupling of said light output signal from said other end to said detector;

a reflective layer of electrically non-conductive optically reflective material bonded to and covering substantially all of the surface of said rod-shaped member;

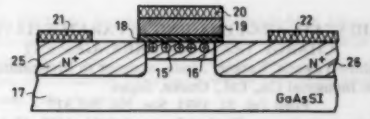
a body of electrically non-conductive opaque material enclosing said rod-shaped member and emitter and detector;

the outer ends of said respective terminals extending from said body and providing external electrical connections for said emitter and detector.

4,450,462
GAAS FIELD EFFECT TRANSISTOR WITH A NON-VOLATILE MEMORY

Trong L. Nuyen, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Aug. 19, 1981, Ser. No. 294,382
Claims priority, application France, Aug. 20, 1980, 80 18186
Int. Cl.³ H01L *29/78, 29/161, 27/12*
U.S. Cl. 357—23 **9 Claims**

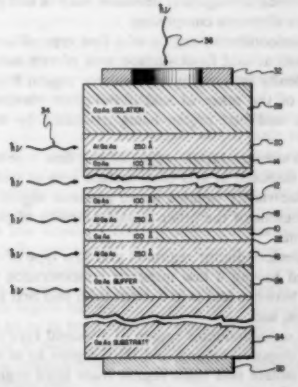


1. A field effect transistor with a non-volatile memory effect, comprising: supported by a semi-insulating substrate, two access regions called the source and the drain, respectively and a control region constituted by an active layer on said substrate and by a control grid on said active layer and itself formed by a semi-insulating layer in contact with the active layer and an insulating layer on said semi-insulating layer in contact with a control metallization, wherein the semi-insulating layer has a thickness below 100 angströms so as to permit the passage of electrons by the tunnel effect and wherein it is made from a material from the group of III–V semiconductors having a broader forbidden band than that of the material forming the active layer and having a structure and crystalline parameters close to those of the material of said active layer.

4,450,463
MULTIPLE-QUANTUM-LAYER PHOTODETECTOR

Raymond Chin, Thousand Oaks, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Jun. 29, 1981, Ser. No. 278,804
Int. Cl.³ H01L *27/14*
U.S. Cl. 357—30 **4 Claims**



1. A multiple-quantum-layer detector for responding to photons having a predetermined amount of energy, comprising:

a plurality of layers of a first semiconducting material having a first conduction band energy level; and

a plurality of layers of a second semiconducting material having a second conduction band energy level differing from said first conduction band energy level by no more than said predetermined energy,

said second layers alternating with said first layers to establish therebetween a plurality of heterojunctions,

said second layers being sufficiently thin to prevent the recapture of electrons photoexcited from said second layers, said first layers being sufficiently thick to accelerate said photoexcited electrons under the influence of said electric potential.

4,450,464

SOLID STATE AREA IMAGING APPARATUS HAVING A CHARGE TRANSFER ARRANGEMENT

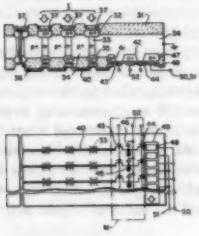
Takahiro Yamada, Katano, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jul. 22, 1981, Ser. No. 285,317

Claims priority, application Japan, Jul. 23, 1980, 55-101617; Jul. 23, 1980, 55-101618

Int. Cl.³ H01L *27/14, 31/00, 29/80, 29/78*

U.S. Cl. 357—30 **6 Claims**



1. A solid state imaging apparatus having a charge transfer arrangement and including a plurality of photosensor elements disposed in a matrix and a charge transfer means for transferring charges generated and accumulated in a photoelectric converting region of said matrix, said charges being transferred from a front surface area of a substrate to a back surface area of said substrate through said substrate, each of said plurality of photosensor elements comprising:

a first semiconductor region of a first type of conductivity disposed at said front surface area of said substrate and electrically isolated by an insulator region from first regions of the other of said plurality of photosensor elements, said first region being irradiated by an incident light;

a second semiconductor region of said first type of conductivity disposed at said back surface area of said substrate and electrically isolated by an insulator region from second regions of the other of said plurality of photosensor elements;

a third semiconductor region of said first type of conductivity and having a low impurity concentration which extends between and is in contact with said first and second regions; and

a fourth semiconductor region of a second type of conductivity disposed around said third region so as to substantially isolate said third region from third regions of the other of said plurality of photosensor elements; said fourth region being supplied with a control voltage, whereby a channel is formed in said third region between said first and second regions.

4,450,465

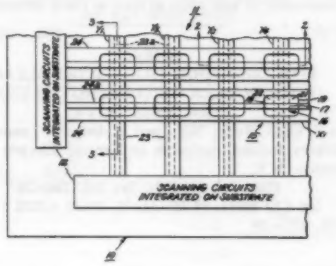
RADIATION TRANSMISSIVE ELECTRODE STRUCTURE

Joseph M. Pimbley, Schenectady, and Herbert R. Philipp, Scotia, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Sep. 23, 1981, Ser. No. 304,733

Int. Cl.³ H01L *27/14*

U.S. Cl. 357—30 **5 Claims**



1. A radiation sensing array comprising

a substrate of semiconductor material having a major surface,

said substrate having a plurality of surface regions arranged in a line,

a thick layer of insulating material having a plurality of thin portions overlying said major surface, each thin portion in registry with a respective one of said surface regions, each thin portion including a first part centrally located therein, a second part contiguous with one side of said first part, and a third part contiguous with the other side of said first part,

a first strip of a conductive material of high electrical conductivity having electrode portions overlying first parts of the thin portions of said thick layer of insulating material,

a second strip of doped polycrystalline silicon having electrode portions overlying said first strip and in contact therewith and second and third parts of said thin portions of said thick layer of insulating material, said electrode portions of said first strip and said second strip constituting the conductors of a plurality of conductor-insulator-semiconductor capacitors formed with the thin portions of said insulating material and said surface regions of said substrate, said second strip being substantially wider than said first strip, said second strip being substantially thinner than said first strip,

means for making electrical connections to said substrate and to said first and second strips.

4,450,466

SEMICONDUCTOR IMAGE SENSOR

Jun-ichi Nishizawa; Tadahiro Ohmi, both of Sendai, and Seiji Matsumoto, Minami-ashigara, all of Japan, assignors to Fuji Photo Film Co., Ltd., Japan

Filed Dec. 2, 1981, Ser. No. 326,883

Claims priority, application Japan, Dec. 5, 1980, 55-171898

Int. Cl.³ H01L *27/14, 29/78, 27/12, 27/04*

U.S. Cl. 357—30 **3 Claims**

1. A semiconduction image sensor comprising:

a low resistivity first region of a first conductivity type;

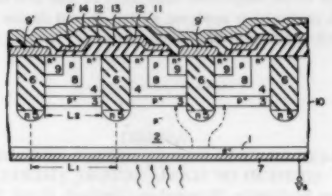
a high resistivity second region of a selected conductivity type;

a low resistivity third region of a second conductivity type reverse from the first type;

a low resistivity fourth region of the first conductivity type, the first to fourth regions being sequentially formed one

on another in a semiconductor substrate inwardly thereof from its surface;

an insulating isolation region extending through the third and fourth regions for isolating at least two portions of the third and fourth regions from each other in a lateral direction;



a fifth region of a conductivity type reverse from the selected type taperingly extending into the second region in a vertical direction from a portion of the insulating isolation region facing towards the first region and being between the at least two portions of the third and fourth regions;

an electrode disposed in contact with the fourth region; and

readout means connected to the fourth region.

4,450,467

GATE TURN-OFF THYRISTOR WITH SELECTIVE ANODE PENETRATING SHORTS

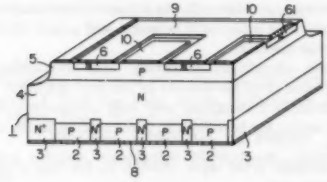
Takahiro Nagano, Hitachi; Isamu Sanpei, Kitaibaraki; Shuroku Sakurada, and Masaru Nakagawa, both of Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 74,523, Sep. 11, 1979, abandoned. This application Jun. 12, 1981, Ser. No. 273,035

Claims priority, application Japan, Sep. 14, 1978, 53-112257

Int. Cl.³ H01L *29/74*

U.S. Cl. 357—38 **12 Claims**



1. A gate turn-off thyristor, comprising:

a semiconductor substrate having first and second major surfaces;

said semiconductor substrate having four semiconductor layers including:

an anode layer of a first conductivity type and a predetermined thickness, said anode layer having a first layer surface lying in said first major surface and having a second layer surface;

a lightly doped anode-base layer of a second conductivity type having a first layer surface contiguous with the second layer surface of said anode layer and having a second layer surface;

a cathode-base layer of a first conductivity type having a first layer surface contiguous with the second layer surface of said anode-base layer and having a second layer surface; and

a cathode layer of said second conductivity type having a first layer surface contiguous with the second layer surface of said cathode-base layer and having a second layer surface lying in said second major surface,

wherein said anode-base layer further comprises selected portions of highly doped semiconductor material of said second conductivity type extending deeper than said thickness of said anode layer from said first major surface through said anode layer into said lightly doped anode-base layer;

at least one of said highly doped selected portions of said anode-base layer serving as a shorting region for said gate turn-off thyristor to short across said anode layer to couple said lightly doped anode-base layer to said first major surface;

a part of said anode layer and the cathode layer being superposed with respect to each other when the part of said anode layer is projected onto the cathode layer in a direction perpendicular to said major surfaces of the substrate;

an anode electrode provided at said first major surface in contact with said anode layer and said highly doped selected portions of said anode-base layer;

a cathode electrode connected only to said cathode layer; and

a gate electrode provided at the cathode-base layer for controlling the on and off operation of the thyristor by controlling a current flow between said cathode and anode electrodes in accordance with a gate signal applied to said gate electrode.

4,450,468

GALLIUM ARSENIDE ISL GATE WITH PUNCHED-THROUGH BIPOLAR DRIVER TRANSISTOR

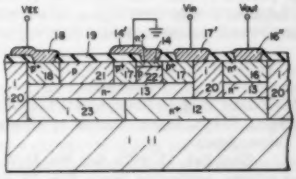
Junichi Nishizawa, and Tadahiro Ohmi, both of Miyagi, Japan, assignors to Handotai Kenkyu Shinkokai, Sendai, Japan

Continuation of Ser. No. 116,415, Jan. 29, 1980, abandoned. This application Aug. 24, 1982, Ser. No. 411,121

Claims priority, application Japan, Jan. 31, 1979, 54-10828

Int. Cl.³ H01L *27/04*; H03K *19/091*

U.S. Cl. 357—51 **3 Claims**



1. A gallium arsenide static induction transistor integrated circuit formed in a semiconductor body comprising:

a semi-insulating substrate; an epitaxial layer grown on said semi-insulting substrate; a static induction transistor; and a resistor connected as a load of said static induction transistor, and resistor and said static induction transistor being formed on said epitaxial layer;

wherein said static induction transistor comprises an n^+ source region formed in contact with a main surface of said epitaxial layer; a p^+ gate region formed in contact with said main surface of said epitaxial layer with said gate region substantially surrounding said source region; an n^+ buried drain region adjacent to said semi-insulating substrate; a low impurity concentration current path region substantially surrounded by said source, gate and drain regions, said current path region including a low impurity p region adjacent to at least said source region, said current path region having dimensions and impurity concentrations so as to be completely covered with a depletion region at a zero, off-state gate bias; and at least one Schottky contact connected as an output terminal to said drain region; and

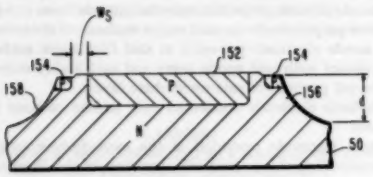
wherein said resistor comprises a p region formed in contact with said main surface of said epitaxial region; and at least a semi-insulating region between said p region and said semi-insulating substrate.

4,450,469

MESA TYPE SEMICONDUCTOR DEVICE WITH GUARD RING

Takeski Yamamoto, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 26, 1981, Ser. No. 228,637
Claims priority, application Japan, Mar. 10, 1980, 55-30649
Int. Cl.³ H01L 29/74, 29/34, 29/06
U.S. Cl. 357—56 3 Claims



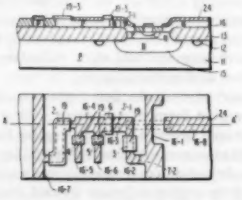
1. A mesa-type semiconductor device comprising a body of semiconductor material, said body having a top surface, a bottom surface and an edge portion extending between said top and bottom surfaces, a first region, having a first-type of conductivity, extending from a portion of said top surface into said body to a depth less than the thickness of said body, a second region having a second type of conductivity, said second region forming a p-n junction with said first region, said second region extending to said top surface around said first region, a third region, said third region having said first type of conductivity, said third region extending from said top surface into said body to a depth less than said first region, said third region being spaced apart from said first region by said second region, the edge portion of said body being beveled from said top surface, adjacent to said third region, to a depth equal to approximately twice the depth of said third region.

4,450,470

SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE

Hiroshi Shiba, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Feb. 12, 1979, Ser. No. 11,582
Claims priority, application Japan, Feb. 10, 1978, 53-14251; Feb. 10, 1978, 53-14252
Int. Cl.³ H01L 27/04, 29/04, 23/52, 27/13
U.S. Cl. 357—59 1 Claim



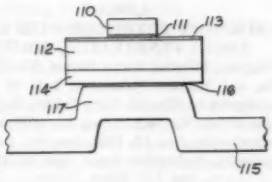
1. An integrated circuit device comprising a semiconductor substrate, an insulating film covering at least a part of one major surface of said substrate, a thin polycrystalline silicon layer formed on said insulating film, said silicon layer having a common portion and first and second branch portions connected at their one ends to said common portion and running in parallel with each other, first, second, and third PN junctions formed in said silicon layer from the upper surface to the bottom of said layer, a highly conductive layer covering the upper surface of said silicon layer except predetermined portions where diodes are to be formed, said first PN junction being located in said common portion and shorted by said highly conductive layer, and said second and third PN junctions being located in said first and second branch portions, respectively, said highly conductive layer being absent at said second and third PN junctions to form diodes there, and means coupled to the respective other ends of said first and second branch portions for applying signals to said diodes formed in said first and second branch portions.

4,450,471

SEMI-CONDUCTOR POWER DEVICE ASSEMBLY AND METHOD OF MANUFACTURE THEREOF

Felicitas Wellböefer, Birmingham, England; David W. Stacey, deceased, late of Birmingham, England, and by Lesley A. Stacey, legal representative, Solihull, England, assignors to Lucas Industries Limited, Birmingham, England

Filed Jun. 12, 1981, Ser. No. 272,960
Claims priority, application United Kingdom, Jun. 21, 1980, 8020407
Int. Cl.³ H01L 23/14, 23/34
U.S. Cl. 357—80 10 Claims



1. In an assembly containing a semi-conductor power device and a base material heat sink, the improvement comprising:
- a heat spreader interposed between said power device and said base material;
- a ceramic, electrically insulating, heat conducting, layer spray-bonded to the bottom of the heat spreader;
- an electrically conducting and heat conducting bonding layer means for bonding the base material to the ceramic layer;
- a thin metallic plate layer bonded to the top of the heat spreader; and
- a solder layer bonding the metallic plate layer to the semiconductor power device.

4,450,472

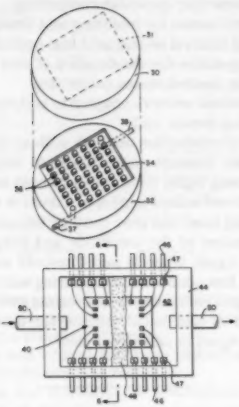
METHOD AND MEANS FOR IMPROVED HEAT REMOVAL IN COMPACT SEMICONDUCTOR INTEGRATED CIRCUITS AND SIMILAR DEVICES UTILIZING COOLANT CHAMBERS AND MICROSCOPIC CHANNELS

David B. Tuckerman, and Roger F. W. Pease, both of Stanford, Calif., assignors to The Board of Trustees of the Leland Stanford Junior University, Stanford, Calif.

Filed Mar. 2, 1981, Ser. No. 239,407
Int. Cl.³ H01L 25/04; F28F 7/00
U.S. Cl. 357—82 17 Claims

1. A heat generating device having improved heat removal capability comprising: a body portion having an external surface for cooling; a plurality of microscopic channels defined by fins in intimate contact with said external surface, the width of said channels being defined by

$$W_C = \sqrt[4]{\frac{36\ Nu\ \mu k_l L^2}{\rho C P}}$$



where

μ = viscosity of coolant in poise ($g\ cm^{-1}\ s^{-1}$)

k_l = thermal conductivity of coolant ($W\ cm^{-1}\ K^{-1}$)

ρC = volumetric heat capacity of coolant ($J\ K^{-1}\ cm^{-3}$)

P = driving pressure for forced convection (dynes $cm.^{-2}$)

L = length of circuit substrate in direction of flow (cm)

W_C = width of channels (cm)

Nu = Nusselt number;

a coolant input chamber and a coolant output chamber, said chambers being connected by said channels; and a cover attached to said fins and to said chambers, to confine the flow of a coolant fluid through said channels.

4,450,473

CAMERA SYSTEM FOR COLOR TELEVISION

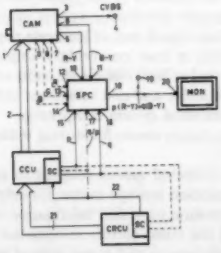
Nicolaas J. L. Van Der Valk, Breda, Netherlands, assignor to U.S. Philips Corp., New York, N.Y.

Filed Nov. 9, 1981, Ser. No. 319,835

Claims priority, application Netherlands, Dec. 2, 1980, 8006546

Int. Cl.³ H04N 9/62

U.S. Cl. 358—10 **2 Claims**



1. A camera system for color television comprising a color television camera, a camera control unit and a signal processing circuit, the camera unit being coupled to the signal processing unit to supply signals containing color information and luminance information, the camera control unit being coupled to the color television camera and the control unit, the signal processing unit generating a composite color difference signal p(R−Y)+q(B−Y), wherein p and q are combination factors, Y is the luminance signal, R is the red color signal, and B is the blue color signal, the improvement comprising a selection circuit included in said signal processing circuit having means for generating three pre-determined test signals, each test signal having a fixed ratio between the combination factors p and q, one of said three test signals being coupled to said signal processing circuit, said signal processing circuit generating a composite color difference signal R−G, R−B and B−G, respectively for said test signals wherein R is the red color signal, B is the blue color signal and G is the green color signal.

4,450,474

PAL SYSTEM SYNCHRONIZING SIGNAL GENERATING APPARATUS

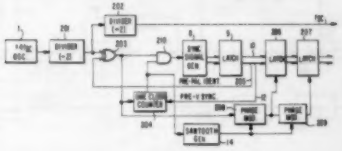
Mineo Mizukami, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Apr. 5, 1982, Ser. No. 365,683

Claims priority, application Japan, Apr. 3, 1981, 56-50083

Int. Cl.³ H04N 9/46, 5/06

U.S. Cl. 358—19 **8 Claims**



1. In a PAL system of the type having 625 lines per frame and two fields per frame of a television signal having a color subcarrier frequency f_{sc}, a PAL system synchronizing signal generating apparatus comprising:

means for producing a reference signal having a frequency ($2f_{sc}$) which is twice that of said color subcarrier frequency (f_{sc});

generating means for generating 569 cycles of said reference signal during one line in each field and 568 cycles of said reference signal during all other lines;

means responsive to the output of said generating means for producing a pre-synchronizing signal; and

means for shifting the phase of said pre-synchronizing signal to produce a synchronizing signal, the amount of phase shift varying linearly with respect to elapsed time during each field from zero at the start of each field to $1/2f_{sc}$ at the end of each field.

4,450,475

SOLID STATE COLOR IMAGING APPARATUS

Kiyotsugu Ishikawa, Takatsuki; Yoshiaki Sone, Toyonaka; Susumu Hashimoto, Moriyama; Masanori Ōmae, Nagaokakyo, and Takao Kunii, Amagasaki, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Feb. 5, 1982, Ser. No. 346,152

Claims priority, application Japan, Feb. 10, 1981, 56-18789

Int. Cl.³ H04N 9/07

U.S. Cl. 358—44 **7 Claims**

1. A solid state color imaging device comprising:

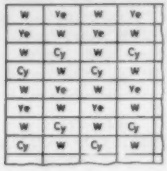
a solid state photoelectric device,

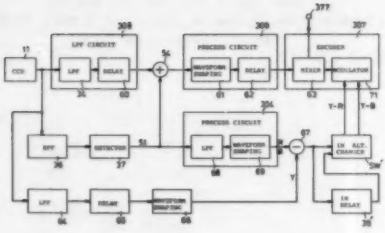
a color filter disposed in front of said solid state photoelectric device, said color filter has a number of minute filter elements of transparent parts, a first complementary color parts and a second complementary color parts, and

a signal processing circuit for processing output signal of said solid state photoelectric device,

said filter elements being disposed forming a number of parallel vertical columns and at the same time forming a number of horizontal rows, said vertical columns forming a sequence of said transparent part, said first complementary color part, said transparent part and said second

complementary color part and repetition of the same, every two vertical columns having the same kinds of elements on the same horizontal row, and with regard to each other neighboring two vertical columns said transparent part neighbors with either said first complementary color part or said second complementary color part, thereby said transparent parts forming chequered disposition.



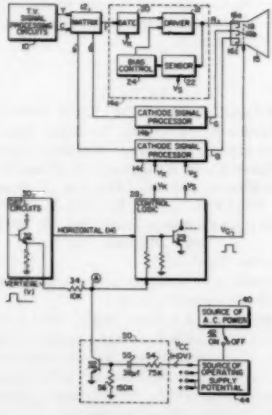


4,450,476

DELAYED REACTION AUTOMATIC KINESCOPE BIASING SYSTEM

James C. Tallant, II, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.

Filed Jun. 23, 1982, Ser. No. 391,416
Int. Cl.³ H04N 5/68, 9/20
U.S. Cl. 358—74 **8 Claims**



1. In a video signal processing system including a kinescope for displaying an image in response to image representative video signals applied thereto said kinescope exhibiting an initial conduction characteristic during an initial interval commencing when said system is initially energized, and exhibiting a normal conduction characteristic afterwards; means for supplying system operating voltages when said system is energized; and bias control means coupled to said kinescope and operative in response to a timing signal supplied thereto via a timing signal coupling path, for automatically controlling the bias of said kinescope; apparatus comprising:

timing control means for inhibiting said timing signal during said initial interval so that said bias control means is rendered inoperative for the duration of said initial interval, said timing control means comprising

a time constant network coupled to said operating voltage supplying means; and

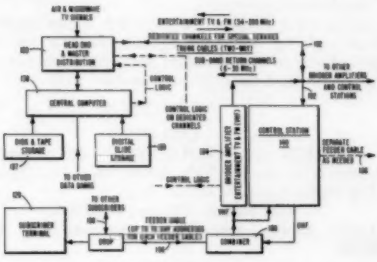
a threshold conduction network with an input coupled to said time constant network and an output coupled to said timing signal path, said threshold network exhibiting first and second conductive states in response to bias provided from said time constant network substantially independent of the amplitude and duty cycle of said timing signal; wherein said threshold network exhibits (a) said first conductive state during said timing signal in said signal path, and (b) said second conductive state at the end of said initial interval for then enabling said timing signal in said signal path.

4,450,477

TELEVISION INFORMATION SYSTEM

Bruce E. Lovett, 1005 Congress La., McLean, Va. 22101

Filed Mar. 31, 1982, Ser. No. 363,959
Int. Cl.³ H04H 7/18
U.S. Cl. 358—86 **38 Claims**



1. A cable television information system for transmitting video picture information to television receivers at subscriber terminals on a cable distribution system, said cable distribution system including a head end, at least one trunk line connected to said head end, at least one bridger amplifier connected to said trunk line and at least one feeder cable connected between said bridger amplifier and said subscriber terminals, said cable television information system comprising:

information storage means for storing video picture information;

information retrieval means coupled to said head end and said information storage means for retrieving video picture information from said information storage means and supplying the video picture information to said head end for transmission on said trunk lines of said cable distribution system;

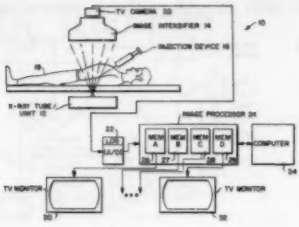
control means associated with at least one of said bridger amplifiers and at least one of said feeder lines for capturing and storing the video picture information on said trunk line, said control means including transmission means for transmitting the video picture information to one of said subscriber terminals on a television channel dedicated to said one subscriber terminal.

4,450,478

DIGITAL FLUOROGRAPHIC METHOD AND SYSTEM

Robert S. Ledley, Silver Spring, Md., assignor to Georgetown University, Washington, D.C.

Filed Sep. 9, 1981, Ser. No. 300,587
Int. Cl.³ H04N 7/18
U.S. Cl. 358—111 21 Claims



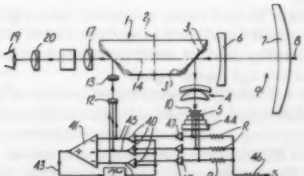
1. A digital fluorographic method, comprising the steps of:
(a) obtaining an x-ray picture of a subect, said x-ray picture comprising a plurality of frames;
(b) digitizing and storing said x-ray picture as digital x-ray picture data divided into frames;
(c) averaging and convolving a predetermined number of said frames of said digital x-ray picture data to develop first processed picture data and displaying by a first display means said first processed picture data;
(d) injecting a contrast medium into the subject;
(e) obtaining a further x-ray picture of the subject;
(f) digitizing and storing said further x-ray picture as further digital x-ray picture data;
(g) operating on said further digital x-ray picture data to develop second processed picture data and displaying by a second display means said second processed picture data; and
(h) subtractively combining said first and second processed picture data to produce picture information corresponding to a pictorial representation of differences between said x-ray picture prior to injection of said contrast medium and said further x-ray picture after injection of said contrast medium and displaying by a third display means said pictorial representation of differences whereby there is a simultaneous display by said first, second and third display means.

4,450,479

THERMAL IMAGING APPARATUS

David R. Horne, Crowborough, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 15, 1982, Ser. No. 368,782
Claims priority, application United Kingdom, Apr. 29, 1981, 8113286
Int. Cl.³ H04N 7/18
U.S. Cl. 358—113 6 Claims



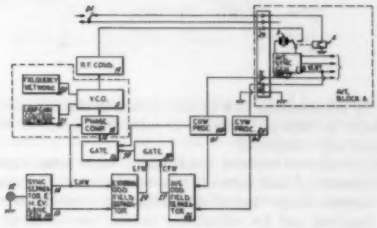
1. Thermal imaging apparatus for producing a visible version of a scene represented by thermal infrared radiation, said apparatus comprising an objective lens arranged to form an infrared image of said scene upon an array of infrared radiation detectors, means for scanning said image transversely relative to said array, display means for reconstructing a visible version of said scene from the electrical output signals of the detectors, a summing device for forming an output signal derived from the sum of all detector output signals, and means for adding the output signal in negative feedback to each of the detector outputs.

4,450,480

SYNCHRONIZATION INTERFACE DEVICE FOR AUTONOMUS VIDEO EQUIPMENT

Juan De La Cierva, Key Biscayne, Fla., assignor to Scitech Corporation, Miami, Fla.

Filed Apr. 5, 1982, Ser. No. 365,786
Int. Cl.³ H04N 5/04
U.S. Cl. 358—149 4 Claims

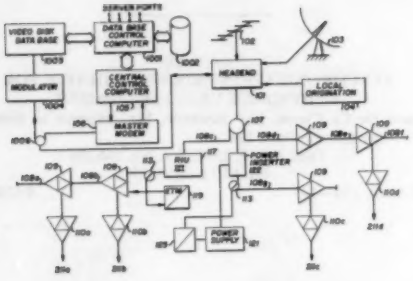


1. An interface device to be used in conjunction with an external video signal to synchronize and manipulate the video signals from video equipment provided with built-in generators of internal synchronization signals including horizontal and vertical drive signals, comprising, in operative combination:
(A) switch means for bypassing the crystal input to said generator;
(B) means for separating the horizontal and vertical sync components from said external video signal, including two generators of continuously running pulses triggered by said horizontal and vertical sync components;
(C) means for separating the odd field of each of said internal video signal scan frame connected to the horizontal and vertical drive signals of said built-in generator;
(D) means for separating the odd field of each of said external video signal scan frame connected to the output of said two generators of continuously running pulses;
(E) first means for gating having its two inputs connected to the outputs of said means for separating the odd fields of said external and internal video signal scan frame thereby causing the output of said first gating means to be at a predetermined state when the external and internal video signals are in synchronization;
(F) second means for gating having one of its two inputs connected to the output of said first means for gating and the other input being connected to the horizontal drive signal of said built-in generator;
(G) phase comparator means having one of its two inputs connected to the output of said second means for gating and the other input being connected to the output of said generator of continuously running pulses triggered by the external horizontal sync component;
(H) voltage controlled oscillator means driven by the output of said phase comparator means and having its output connected to said switch means for bypassing the crystal of said built-in generator.

4,450,481
TAMPER-RESISTANT, EXPANDABLE COMMUNICATIONS SYSTEM

Robert V. C. Dickinson, Berkeley Heights, N.J., assignor to E-Com Corporation, Milford Square, Pa.

Filed Aug. 25, 1981, Ser. No. 296,171
Int. Cl.³ H04N *7/16, 7/10*
U.S. Cl. 358—114 **6 Claims**



1. In combination in a broadbandwidth multichannel cable network including a plurality of subscriber drops or terminal devices and a headend:

a plurality of remote interrogator units connected in a branch of said network for receiving and storing subscriber drop channel allocation information from said headend and for selectively passing communications information to said headend and

a plurality of groups of expansion modules connected in said branch of said network; each module of said groups controlling a respective plurality of said subscriber drops or terminal devices; all of said expansion modules of one of said groups having means for being selectively sequentially accessed by one of said remote interrogator units;

band stop filter means associated with each of said remote interrogator units and interposed in said branch of said network to isolate a group of said expansion modules in a segment of said branch for control by only one of said plurality of remote interrogator units, whereby control of others of said groups of expansion modules in other segments of said branch may be simultaneously maintained by others of said plurality of remote interrogator units in said branch.

4,450,482
DIGITAL REAL-TIME VIDEO IMAGE PROCESSING DEVICE

Rudolf Ackermann, Erlangen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Feb. 16, 1982, Ser. No. 349,373
Claims priority, application Fed. Rep. of Germany, Mar. 2, 1981, 3107901
Int. Cl.³ H04N *5/20*
U.S. Cl. 358—160 **5 Claims**

1. A digital real-time video image processing system according to the principle of non-linear manipulation of the brightness distribution of video pictures by means of matching the brightness distribution (histogram) to a prescribed function F(H), characterized in that an arithmetic unit with a histogram memory is provided for determining the histogram of a video image, said histogram memory having an address input for receiving digitized image point information and being operable for storing a set of histogram values based on said information; in that a processing circuit is connected to the histogram memory, said processing circuit calculating correction values from the stored histogram values for converting received image point information into corrected image point information in accord with the prescribed function F(H), said processing circuit including a correction memory for storing the corrected values, said correction memory having an address input, and means for supplying image point information of a video

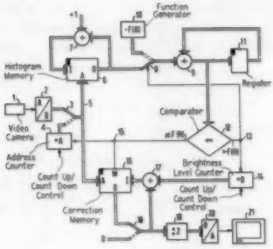


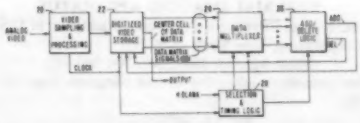
image to the address input of the correction memory for conversion in accord with the correction values stored there,

characterized in that the prescribed function F(H) is a constant which corresponds to the mean value of the histogram parameters of the system.

4,450,483
CIRCUIT FOR IMPROVING THE QUALITY OF DIGITIZED LINE IMAGES

John W. Coviello, Baltimore, Md., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 2, 1981, Ser. No. 298,557
Int. Cl.³ H04N *5/14*
U.S. Cl. 358—166 **6 Claims**



1. A system for producing a line drawing, comprising in combination:

(a) apparatus for processing a sampled video signal to produce a digital signal comprising a plurality of bits wherein each sampling point of the video signal is represented by a single bit digit digital signal;

(b) means for storing a predetermined number of said single bit digital signals to produce a data matrix, said data matrix comprising a predetermined number of sample points;

(c) means for comparing a selected element of said data matrix to a predetermined number of other elements of said data matrix to determine if the quality of said line drawing can be improved by changing the value of said selected element; and

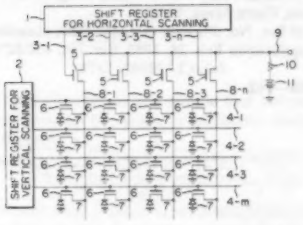
(d) means for selectively changing said selected element to improve the quality of said line drawing.

4,450,484

SOLID STATES IMAGE SENSOR ARRAY HAVING CIRCUIT FOR SUPPRESSING IMAGE BLOOMING AND SMEAR

Sumio Terakawa, Osaka, and Kenju Horii, Shiga, both of Japan, assignors to Matsushita Electronics Corporation, Osaka, Japan

Filed May 20, 1981, Ser. No. 265,582
Claims priority, application Japan, May 22, 1980, 55-68358
Int. Cl.³ H04N 3/14
U.S. Cl. 358—213 2 Claims



1. A solid-state image sensor comprising:

a plurality of photoelectric transducer elements arranged in a matrix array consisting of m columns and n rows, for storing charge corresponding to a light image impinging thereon;

first charge transfer means comprising metal-insulator-semiconductor vertical shift resister means and switching means for transferring the light image charge stored in said photoelectric transducer elements to corresponding vertical transmission lines;

second charge transfer means for transferring the charge transferred from said transducer elements to said vertical transmission lines, to corresponding charge-coupled horizontal shift register means;

first storage capacitor means having a capacitance lower than that of said vertical transmission lines;

means for applying a first pulse voltage to one electrode of said first storage capacitor means, the other electrode thereof serving as a storage means;

first transfer gate means responsive to a second pulse voltage for effecting charge transfer between said storage means and said vertical transmission lines;

second transfer gate means responsive to a third pulse voltage for effecting charge transfer from said storage means to said horizontal shift register means;

third charge transfer means interposed between said first storage capacitor means and said second charge transfer gate means and comprising a second storage capacitor means;

means for applying a voltage to one electrode of said second storage capacitor means, the other electrode thereof serving as storage means;

fourth transfer gate means and drain means adjacent said second storage means, for discharging the charge therein except for said light signal charge; and

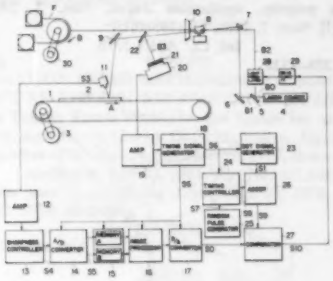
fourth charge transfer means coupled to said fourth transfer gate means for discharging the charge except said light signal charge to one electrode of a corresponding one of each of said vertical transmission lines.

4,450,485

IMAGE SCANNING AND RECORDING METHOD

Yuji Oshikoshi, and Toshitaka Agano, both of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed May 18, 1982, Ser. No. 379,343
Claims priority, application Japan, May 22, 1981, 56-78329
Int. Cl.³ H04N 1/40
U.S. Cl. 358—298 8 Claims



1. An image scanning and recording method for scanning a continuous tone original and recording a reproduction thereof on a recording medium, said method comprising the steps of:

adding a random pulse signal to a selected one of an image signal obtained by scanning the continuous tone original and a dot signal controlled synchronously with said scanning of the original;

comparing said image signal with said dot signal to obtain a randomized dot image signal;

on-off modulating a light beam in accordance with said randomized dot image signal; and

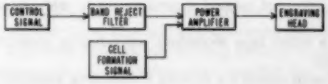
scanning a photosensitive recording medium with said on-off modulated light beam so as to record thereon a dot image corresponding to said continuous tone original.

4,450,486

ENGRAVING APPARATUS AND METHOD

Lester W. Buechler, Dayton, Ohio, assignor to Ohio Electronic Engravers, Inc., Dayton, Ohio

Division of Ser. No. 056,623, Jul. 11, 1979, Pat. No. 4,357,633.
This application Sep. 24, 1982, Ser. No. 422,652
Int. Cl.³ H04N 1/40
U.S. Cl. 358—299 2 Claims



1. Apparatus for engraving cells in the surface of a gravure printing cylinder, comprising an engraving head, means supporting said head for relative movement adjacent the surface, said head including a shaft and an engraving stylus having a pointed tip, means on said shaft and supporting said stylus eccentrically of the axis of said shaft with said tip projecting in a tangential direction, spring means rigidly secured to said head and supporting said shaft for oscillation on its axis to effect angular oscillating movement of said stylus tip in a radial plane for producing cells within the surface, the oscillating components including said shaft and said stylus and said stylus supporting means having a natural frequency, power operated drive means for oscillating said components, a power supply connected to said oscillating drive means, and said power supply including an electrically compensating circuit having a

filter with a band rejection characteristic effective to compensate for the natural frequency of said oscillating components.

4,450,487

TELEVISON CAMERA AND REMOTE-CONTROLLABLE VIDEO SIGNAL RECORDING/REPRODUCING APPARATUS

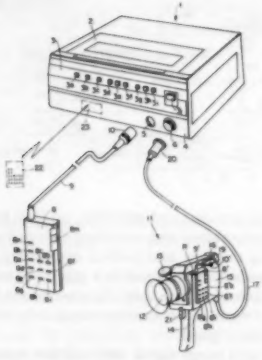
Hajime Koide, Ichikawa, Japan, assignor to Victor Company of Japan, Limited, Yokohama, Japan

Filed Nov. 6, 1981, Ser. No. 319,103

Claims priority, application Japan, Nov. 7, 1980, 55-159379[U]; Nov. 7, 1980, 55-159380[U]

Int. Cl.³ A04N *5/76*

U.S. Cl. 358—335 **4 Claims**



2. A video tape recording/reproducing system comprising:

(a) a television camera for producing an output electrical signal indicative of images of a subject, the camera including:

a body;

a lens system attached to said body;

a photosensitive element held in said body and being responsive to light rays from said lens system for producing a video signal;

a camera cable for transmitting the output signal of said television camera, said camera cable having a plurality of wires;

first means for holding a remote-control unit so that said remote-control unit is detachably attached to said body;

second means for receiving remote-control signals from said remote-control unit; and

third means for transmitting said remote-control signals received by said second means to said camera cable;

and

(b) a video tape recording/reproducing apparatus, including:

fourth means for driving a recording medium;

fifth means for processing an input signal to record the same on said recording medium;

sixth means for receiving signals from said television camera via said camera cable, said sixth means having a plurality of conductors respectively contactable with said wires of said camera cable, some of said conductors being connected to said fifth means for feeding said fifth means with the output video signal from said television camera;

seventh means for receiving signals from said remote-control unit which has been detached from said television camera, said seventh means having a plurality of conductors connected to said fourth means for controlling the operation of said video signal recording/reproducing apparatus in response to remote-control signals from said remote control unit; and

eighth means having a plurality of conductors connected between said conductors of said seventh means and some of said conductors of said sixth means so that remote-control signals fed via said television camera cable are fed to said fourth means when said remote-control unit is attached to said television camera.

4,450,488

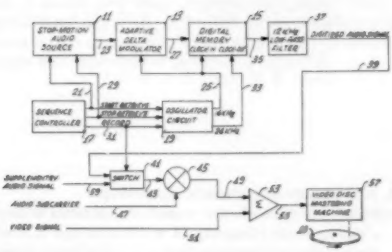
SYSTEM FOR RECORDING CONTINUOUS-PLAY AND STOP-MOTION SIGNAL

Scott M. Golding, Costa Mesa, Calif., assignor to Discovision Associates, Costa Mesa, Calif.

Division of Ser. No. 202,840, Oct. 31, 1980, abandoned. This application Feb. 28, 1983, Ser. No. 470,827

Int. Cl.³ H04N *5/76*

U.S. Cl. 358—342 **12 Claims**



1. A method of recording a video signal and a stop-motion audio signal on a record medium, the video signal representing a plurality of continuous-play video frames and a stop-motion video frame associated with the stop-motion audio signal, the method comprising steps of:

combining the stop-motion audio signal and the portion of the video signal representing the continuous-play video frames, to form a composite signal;

recording the composite signal on a first portion of the record medium; and

recording the portion of the video signal representing the stop-motion video frame on a second downstream portion of the record medium.

4,450,489

FLOATING DISC PHOTOCONDUCTIVE FILM READER

James D. Barry, Los Angeles, and Joseph M. Denney, Palos Verdes, both of Calif., assignors to Hughes Aircraft Company, El Segundo, Calif.

Filed Dec. 28, 1981, Ser. No. 334,945

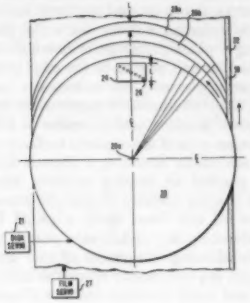
Int. Cl.³ H04N *5/86*

U.S. Cl. 358—348 **12 Claims**

1. In a photoconductive film reader for reading a filmstrip having electrostatically recorded information, the combination comprising:

a disc having a bottom face, said disc rotatable over said film at a sufficiently high rate so that said bottom face may float upon said filmstrip in the presence of a fluid or gase-

ous medium, wherein said filmstrip is moveable beneath said disc; and



a read head attached to said disc at said bottom face, and including means for sensing electrostatic charge stored in said filmstrip.

4,450,490

SYSTEM FOR OBTAINING SYNCHRONIZED REPRODUCTION FROM A PLURALITY OF REPRODUCING APPARATUSES

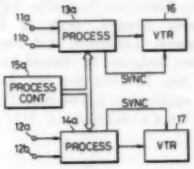
Yasuhiko Fujii, Yamato; Mitsuru Kikuchi, Yokohama, and Hiroyuki Saito, Tokyo, all of Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Oct. 26, 1981, Ser. No. 315,082

Claims priority, application Japan, Oct. 28, 1980, 55-151067

Int. Cl.³ G11B *27/02, 15/46*

U.S. Cl. 360—13 **8 Claims**



1. A system for obtaining synchronized reproduction from a plurality of reproducing apparatuses by obtaining mutually synchronized reproduced signals from a plurality of reproducing apparatuses, each of said plurality of reproducing apparatuses reproducing recorded signals from a recording medium, each recording medium being pre-recorded with mutually identical address signals for each predetermined data signal block, said system for obtaining synchronized reproduction comprising:

stopping means for temporarily and individually stopping reproducing operations of said plurality of reproducing apparatuses when a reproduced address coincides with a preset address in each of said plurality of reproducing apparatuses, and for resuming the reproducing operations of said plurality of reproducing apparatuses so that the address is substantially matched with respect to each recording medium;

control means for controlling reproducing operations of said plurality of reproducing apparatuses so that one reproducing apparatus with respect to another reproducing apparatus among said plurality of reproducing apparatuses performs reproduction in a state advanced by a predetermined quantity on the recording medium;

detection means for comparing and detecting a difference between address signals reproduced by said plurality of reproducing apparatuses; and

memory means controlled for writing-in and reading-out operations by a detection output received from said detection means, for producing a reproduced signal from said one advanced reproducing apparatus after delaying the reproduced signal, so that the delayed reproduced signal from said one advanced reproducing apparatus is in synchronism with a reproduced signal received from said other reproducing apparatus.

4,450,491

OPERATION LEVER MECHANISM FOR MAGNETIC TAPE RECORDING/REPRODUCING APPARATUS

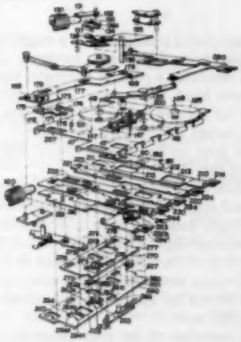
Satoshi Takagi; Toshio Watanabe, and Masao Ito, all of Toda, Japan, assignors to Clarion Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 24,705, Mar. 28, 1979, abandoned. This application Apr. 27, 1981, Ser. No. 257,648

Claims priority, application Japan, Mar. 31, 1978, 53-36704; Mar. 31, 1978, 53-36703

Int. Cl.³ G11B *15/00*

U.S. Cl. 360—96.5 **3 Claims**



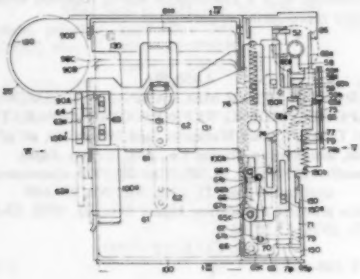
1. Operating mechanism for a magnetic tape recording/reproducing apparatus which comprises: a plurality of depressible operation members provided in said magnetic tape recording/reproducing apparatus; support means on which a magnetic head is mounted, said operation members including at least a play-operation member for advancing said support means, a stop-operation member for withdrawing said support means, a fast forward-operation member and a rewind-operation member; locking means for releasably locking at least the depressed member other than said stop-operation member in its operative depressed state; an interlocking member is provided in association with said stop-operation member for carrying out a cassette ejecting operation when fully moved with the same, said interlocking member having a salient portion and said stop operation member having an engaging portion; stop operation means responsive to the movement of said stop-operation member while one of the other operation members is depressed by preventing the movement of said interlocking member with said stop-operating member to stop an ejection operation; and ejecting operation means responsive to the movement of said stop-operation member while no other operation member is depressed for allowing movement of said interlocking member therewith to effect said cassette ejecting operation; said salient portion of said interlocking member being adapted to be brought into engagement with said engaging portion of said stop operation member by said ejecting operation means, and said salient portion being adapted to be kept from engagement with said engaging portion by said locking means.

4,450,492

INTERLOCKING GEAR CONTROL MECHANISM IN MAGNETIC TAPE RECORDING/PLAYING APPARATUS

Hitoshi Okada; Kazuki Takai, and Katsumi Yamaguchi, all of Saitama, Japan, assignors to Clarion Co., Ltd., Tokyo, Japan

Filed Oct. 28, 1981, Ser. No. 315,810
Int. Cl.³ G11B *15/66, 21/22*
U.S. Cl. 360—105 **3 Claims**



1. A gear control mechanism in a magnetic tape recording/-playing apparatus of the type having a magnetic head and capable of receiving a pack of magnetic tape to be driven past said magnetic head, the mechanism comprising:

a motor for driving a said magnetic tape in said apparatus;

a rotary means driven by said motor;

a driven gear to be engaged with said rotary means for driving thereby;

a gear lock member responsive to insertion of a tape pack into said apparatus for interengaging said driven gear with said rotary means so as to drive said driven gear;

a rack member engaged with said driven gear and responsive to driving of the latter due to said insertion of a tape pack for effecting auto-loading operation of the tape pack;

an eject means for ejecting said tape pack loaded into said apparatus; and

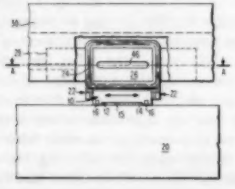
a disengagement means responsive to completion of said operation of said rack member for disengaging said driven gear from said rotary means and for maintaining the disengagement between said driven gear and said rotary means until completion of the eject operation by said eject means.

4,450,493

MAGNETIC HEAD SLIDER AND ACTUATOR ASSEMBLY

Robert B. Watrous, San Jose, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 10, 1981, Ser. No. 320,167
Int. Cl.³ G11B *5/55, 5/60, 21/10, 5/10*
U.S. Cl. 360—106 **6 Claims**



1. A magnetic head and actuator assembly for use in transferring information to and from the magnetic surface of a rotating disk of a disk file comprising in combination:

an air bearing slider on which said magnetic head is disposed including an air bearing surface for maintaining said magnetic head in a data transferring relationship to said magnetic surface as said slider is moved by said actuator relative to said disk to position said head at selected concentric recording tracks on said magnetic surface;

said actuator including a stator and a flat planar armature comprising a planar rectangular bearing element and an energizable flat coil wound on the edge perimeter of said planar bearing element, said rectangular bearing element including a pair of separate continuous air bearing surfaces each disposed adjacent said perimeter to define a shallow air plenum on each of the opposite surfaces of said bearing element, said stator including a channel having a pair of opposed parallel air bearing surfaces which cooperate with said bearing surfaces of said armature to guide the movement of said head along a radial linear path to thereby eliminate any undesirable yaw or tangential motion while allowing movement of said armature within said channel in a role motion around an axis parallel to said disk and said radial direction and in a direction normal to said disk surface to permit said head to follow any flutter of said disk surface;

means associated with said stator for establishing a flux field extending normal to and between said parallel air bearing surfaces;

means for supplying air to said plenum to maintain said stator and said armature in an air bearing relationship;

means for supplying current to said coil to cause movement of said armature relative to said flux field; and

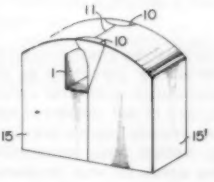
means for attaching said slider to said armature to allow said slider to pivot about an axis parallel to said direction of movement in order to follow the surface of said disk while restraining movement of said slider relative to said armature in all other directions.

4,450,494

MAGNETIC HEAD

Hideo Fujiwara, Tokorozawa; Mitsuhiro Kudo, Tokyo; Teizo Tamura, Katsuta; Nobuyuki Sugishita, Yokosuka; Yoshihiro Shiroishi; Takeshi Kimura, both of Higashimurayama; Kiminari Shinagawa, Kanagawa, and Noriyuki Kumasaka, Ome, all of Japan, assignors to Hitachi Ltd., Tokyo, Japan

Filed Sep. 22, 1981, Ser. No. 304,612
Claims priority, application Japan, Sep. 22, 1980, 55-130734
Int. Cl.³ G11B *5/12, 5/22*
U.S. Cl. 360—125 **28 Claims**



1. A magnetic head having a magnetic core formed by facing a pair of magnetic substances through a working gap at a head section confronting a magnetic recording medium, comprising an oblique part made by at least one of said magnetic substances in the neighborhood of said working gap for forming said working gap, an inner wall of said oblique part being inclined at an angle with a face confronting said magnetic recording medium, said oblique part being made of a magnetic material having magnetic anisotropy, an angle α between a direction having a maximum magnetic permeability in a main magnetic circuit plane of said oblique part and said face confronting said magnetic recording medium being larger than an orientation angle of said direction for making minimum a magnetic reluctance of a main magnetic circuit of said magnetic core by an

angle β, said angle β being given by the following formula:

$$\left(\frac{20D}{L^*} - 10\right)^\circ < \beta < \min\left[\left(\frac{30D}{L^*} + 20\right)^\circ, 50^\circ\right],$$

wherein D indicates a depth of said working gap, L^*, indicates an effective length of said oblique part, and min

$$\left[\left(\frac{30D}{L^*} + 20\right)^\circ, 50^\circ\right]$$

indicates the smaller of

$$\left(\frac{30D}{L^*} + 20\right)^\circ \text{ and } 50^\circ.$$

and 50°.

4,450,495

PORTABLE ACOUSTIC DEVICE

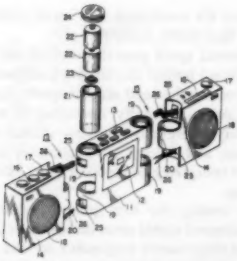
Toshimasa Naruki, Fukushima, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 8, 1981, Ser. No. 309,754

Claims priority, application Japan, Oct. 9, 1980, 55-141550; Oct. 9, 1980, 55-141551; Oct. 9, 1980, 55-144098; Oct. 9, 1980, 55-144099; Oct. 9, 1980, 55-144100; Oct. 9, 1980, 55-144101; Oct. 9, 1980, 55-144102; Feb. 9, 1981, 56-16920[U]; Feb. 9, 1981, 56-16921[U]; Feb. 9, 1981, 56-16922[U]; Feb. 9, 1981, 56-16923[U]; Feb. 9, 1981, 56-16924[U]; Feb. 9, 1981, 56-16925[U]; Feb. 9, 1981, 56-16926[U]; Feb. 9, 1981, 56-16927[U]; Feb. 9, 1981, 56-16928[U]

Int. Cl.³ G11B *5/02*

U.S. Cl. 360—137 **27 Claims**



1. A portable acoustic device in which sound recorded on a magnetic tape is reproduced through at least one loudspeaker, said device comprising:

a body unit for generating signals corresponding to the sound recorded on a magnetic tape, said body unit having a first hollow hinge part with cylindrical inner walls and positioned on at least one side of said body unit;

at least one loudspeaker unit receiving said signals for reproducing said recorded sound, said at least one loudspeaker unit having a second hollow hinge part thereon, said second hollow hinge part having cylindrical inner walls of substantially the same diameter as those of said first hollow hinge part;

at least one cylindrical shaft passing through said first and second hollow hinge parts to thereby act as a hinge shaft about which said body unit and a least one loudspeaker unit are relatively rotatable, said shaft being of a form such that a battery can be fit therein;

electrical signal connecting means between said body unit and said at least one loudspeaker unit; and

electrical power connecting means between the interior of said shaft and said body unit.

4,450,496

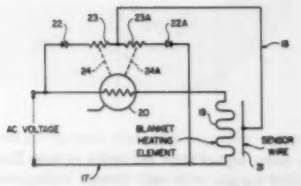
PROTECTION OF CERTAIN ELECTRICAL SYSTEMS BY USE OF PTC DEVICE

Frank A. Doljack, Pleasanton, and Lee M. Middleman, Portola Valley, both of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Continuation-in-part of Ser. No. 67,207, Aug. 16, 1979, abandoned. This application Jan. 26, 1981, Ser. No. 228,347

Int. Cl.³ H02H *3/08, 3/06*

U.S. Cl. 361—58 **8 Claims**



1. An electrical system comprising:

(a) a power circuit comprising a load, a PTC device connected in series with the load and means for connecting the power circuit to a direct current or alternating current power source; and

(b) a control circuit which includes at least one resistive heating element and the current through which becomes significant when a fault condition occurs in the power circuit;

said PTC device being in a low temperature low resistance state under normal steady state operating conditions of the system and being thermally coupled to said resistive element by a metal strap which at least partially encircles said resistive element and extends over at least a portion of the surface of said PTC device, the PTC device and the resistive element being such that

(1), when the power circuit is connected to a power source and a fault condition develops in the power circuit, current flowing through the control circuit causes heating of said resistive element, and the heat generated by said resistive element rapidly raises the temperature of the PTC device, causing the PTC device to change to a high resistance state thus substantially reducing the current through said load in the power circuit; and

(2) when said fault condition is removed and the power circuit is disconnected from the power source, the PTC device cools to a low temperature, low resistance state, and reconnection of the power circuit results in restoration of normal steady state operating conditions.

4,450,497

ULTRA-HIGH-SPEED RELAY

Allan M. Bignell, Mississauga, Canada, assignor to Westinghouse Canada, Hamilton, Canada

Filed Oct. 22, 1982, Ser. No. 436,101

Int. Cl.³ H02H *3/40*

U.S. Cl. 361—82 **12 Claims**

1. A protective relay for determining the direction to a fault, from a measuring point on an electrical power transmission line energized by an ac power source, said protective relay comprising:

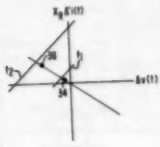
first means for providing a current-derived signal as a function of time, said current-derived signal being representa-

tive of the fault-generated current deviation from the steady-state pre-fault current;

second means for providing a voltage-derived signal as a function of time, said voltage-derived signal being representative of the fault-generated voltage deviation from the steady-state pre-fault voltage;

filter means for removing transients due to traveling wave activity from each of said current-derived and voltage-derived signals, thereby producing a filtered current-derived signal and a filtered voltage-derived signal;

third means for transforming at least one of said filtered current-derived signal and said filtered voltage-derived signal such that the transformation results in the order of differentiation of said filtered current-derived signal being



one order higher than the order of said filtered voltage-derived signal, with said filtered voltage-derived signal and said filtered current-derived signal of different order being referred to as first and second signals respectively;

fourth means for generating a time-varying trajectory in an X-Y plane using said first and second signals as X and Y coordinates respectively;

fifth means for generating a time-varying threshold boundary in at least two predetermined quadrants of said X-Y plane;

and sixth means for determining when said time-varying trajectory exceeds said time-varying threshold boundary for a predetermined time thereby indicating that the fault is in a first direction from the measuring point.

4,450,498

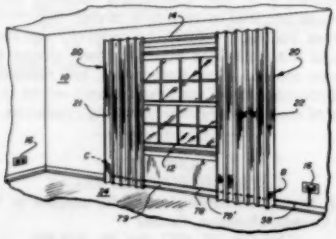
ELECTRICALLY GROUNDED, STATIC ABSORBING DRAPERY INSTALLATION

Burton L. Siegal, Skokie, Ill., assignor to Coral Industrial Sales Co., Chicago, Ill.

Filed Sep. 15, 1982, Ser. No. 418,243

Int. Cl.³ H05F *3/02*

U.S. Cl. 361—212 **11 Claims**



1. In a drapery installation which includes at least one panel of decorative fabric having electrically conductive fibers or filaments fabricated thereinto; said fabric panel being adapted to be hung from a traverse rod with one side edge geneally vertically stationary and a second side edge to be traversed thereby; an electrical connector assembly of component parts strategically installed on the panel for minimal movement therewith during opening and closing of the drapery comprising:

(a) electrically conductive plate means secured to a face of said panel adjacent said generally stationary side edge in electrical connection with said conductive fibers or filaments;

(b) a first terminal member secured in electrical connection to said plate means;

(c) a second terminal member electrically connected to said first terminal member and selectively disconnectable and reconnectable therewith without dissembling the plate means from the panel; and

(d) an elongate electrical conductor member having an end terminal member for connecting said conductor to ground;

(e) said conductor being electrically connected to said second terminal member to electrically ground said panel for dissipating static electric charge accumulated on the panel to said ground without interfering with optimum movement, use and cleaning of the drapery.

4,450,499

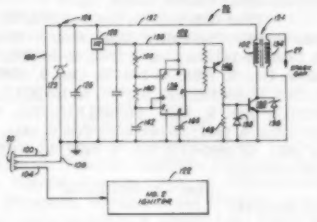
FLARE IGNITION SYSTEM

Roland R. Sorelle, 812 Standifer Rd., Elk City, Okla. 73644

Filed Dec. 21, 1981, Ser. No. 332,666

Int. Cl.³ F23Q *3/00*

U.S. Cl. 361—253 **9 Claims**



1. Apparatus for controlled ignition of combustible gases at a designated flare point, comprising:

first and second spark gaps disposed at said flare point;

first and second igniter circuits each connected to a respective one of the first and second spark gaps;

switching means normally operating in a first mode for repetitively energizing the first igniter circuit and first spark gap, and having an alternative second operating mode for energizing the second igniter circuit and second spark gap;

means for sensing the first igniter circuit to generate an ignition control signal upon detection of energization; and

pulse generating means responsive to said ignition control signal to generate first and second outputs to said switching means to control selection of respective first and second mode operations.

4,450,500

ELECTRIC CAPACITOR OF VARIABLE CAPACITANCE

Werner Wollenschläger, Marktredwitz, Fed. Rep. of Germany, assignor to Draloric Electronic GmbH, Fed. Rep. of Germany

Filed May 26, 1983, Ser. No. 498,244

Claims priority, application Fed. Rep. of Germany, Dec. 9, 1982, 3245523

Int. Cl.³ H01G *5/00, 4/04*

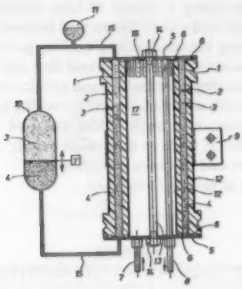
U.S. Cl. 361—277 **23 Claims**

1. An electric capacitor of variable capacitance, comprising:

a dielectric body comprised of densely sintered ceramic material; the body having a hollow space extending through it for holding liquid dielectric therein; the body

having spaced apart surfaces generally at opposite sides of the hollow space;

capacitor plates in the form of metal layers on the spaced apart surfaces of the body, and the plates being separated by the hollow space for defining the capacitor plates; the capacitor plates both having a respective height dimension;



a first liquid dielectric material of relatively higher dielectric constant present up to a variable height in the hollow space, and the variable height being in the electric field of the capacitor; and

a second liquid dielectric material of relatively lower dielectric constant and of lesser density than the first liquid located in the hollow space above the first liquid.

4,450,501

LIQUID QUANTITY SENSOR OF CAPACITOR TYPE

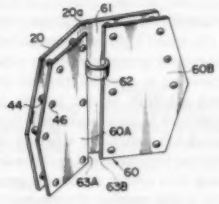
Hiroshi Kobayashi, Yokohama, Japan, assignor to Nissan Motor Co., Ltd., Kanagawa, Japan

Filed May 24, 1983, Ser. No. 497,494

Claims priority, application Japan, Jul. 6, 1982, 57-116240

Int. Cl.³ H01G *5/28*; G01F *23/00*

U.S. Cl. 361—284 **6 Claims**



1. In a sensor for detecting the quantity of a liquid existing in a container, the sensor having at least one set of a first electrode plate and a second electrode plate which are substantially vertically disposed in the container and spaced from each other in a parallel arrangement so as to provide a capacitor, wherein said first electrode plate is of an angled shape and has at least one bent region as a border between two flat areas,

the improvement comprising said second electrode plate being of a split form and comprising two flat portions and a junction portion which is made of an electrically conductive material and fixed to said two flat portions so as to provide a gap between said two flat portions and to keep said two flat portions at an angle corresponding to the angle between said two flat areas of said first electrode plate, said second electrode plate being fastened in said two flat portions thereof to said two flat areas of said first electrode plate such that said gap is located right opposite and parallel to said bent region of said first electrode plate, said junction portion being so shaped and arranged as to become more spaced from said first electrode plate than said two flat portions.

4,450,502

MULTILAYER CERAMIC DIELECTRIC CAPACITORS

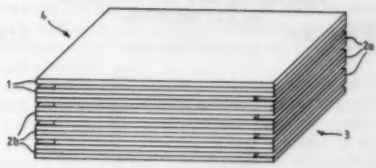
John H. Alexander, Hertfordshire, England, assignor to ITT Industries, Inc., New York, N.Y.

Filed Feb. 28, 1983, Ser. No. 470,760

Claims priority, application United Kingdom, Mar. 30, 1982, 8209283

Int. Cl.³ H01G *1/14, 4/10, 7/00*

U.S. Cl. 361—309 **11 Claims**



11. A multilayer ceramic dielectric capacitor comprising:

a plurality of ceramic dielectric layers;

electrodes located in between the layers and extending to the ends of the layers;

porous conductive end terminations located on the ends of the layers and connected to the electrodes; and

a sulphide layer located on the end terminations.

4,450,503

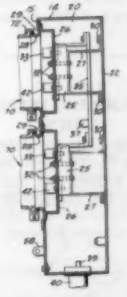
POWER OUTLET FACILITY

Michael J. Warner, Yorba Linda, Calif., assignor to Myers Electric Products Inc., Montebello, Calif.

Filed Sep. 28, 1982, Ser. No. 425,483

Int. Cl.³ H02B *1/04*

U.S. Cl. 361—356 **9 Claims**



1. A power metering facility for metering power to a pair of adjacent power utilizing sites comprising:

a metal box having a bottom, sidewalls and an open top;

partitions dividing said box into an elongated meter compartment and separate customer service compartments along the opposite sides thereof;

a pair of covers for closing respective adjacent portions of said meter compartment and each having an opening sized to accommodate the insertion of a power meter therethrough;

a pair of insulated meter sockets supported adjacent one another in said meter compartment and supported intermediate said box bottom and top by bracket means rigidly

secured to the inner side of said bottom and the inner side of an associated one of said pair of covers by means including fasteners accessible for assembly only through said openings in said covers;

bus bars rigidly connected to and supported by said meter sockets; and

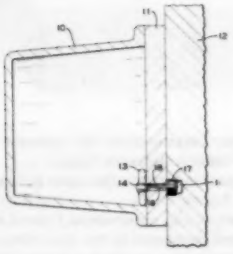
separate circuit breakers and power service receptacles in each of said customer service compartments connected in circuit with a respective one of said meter sockets.

4,450,504

METER TAMPERING INDICATOR

Asbjorn M. Severson, Minneapolis, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Sep. 30, 1982, Ser. No. 429,346
Int. Cl.³ H02B *9/00*
U.S. Cl. 361—369 **6 Claims**



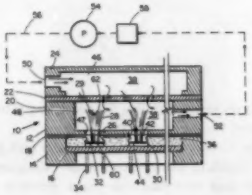
1. An apparatus for indicating watthour meter tampering, said apparatus comprising: a watthour meter having a base member, a plug-in mechanism mounting member and a cover glass fixed to the mechanism mounting member, and wherein an easily rupturable, sealed hollow container is juxtaposed the mechanism mounting member of the watthour meter and fixed through said mounting member to the meter base in a manner such that attempts to unplug the mounting member from the base will cause said sealed hollow container to rupture and thereby indicate meter tampering.

4,450,505

APPARATUS FOR COOLING INTEGRATED CIRCUIT CHIPS

Faquir C. Mittal, Audubon, Pa., and Joseph S. Mathias, Riverton, N.J., assignors to Sperry Corporation, New York, N.Y.

Filed Jun. 9, 1982, Ser. No. 386,557
Int. Cl.³ H05K *7/20*
U.S. Cl. 361—386 **3 Claims**



1. An integrated circuit chips cooling apparatus, comprising:

a housing including a board having integrated circuit chips mounted thereon, said chips having a substantially planar surface;

means mounted in the housing and forming first and second cooling portions, said chips being in said first portion, said second cooling portion including an entrance chamber separated from an exit chamber by a plate having a plurality of apertures formed therein;

first means being a flexible bellows having a first end connected to said mounted means and a second end extending into said first cooling portion and conforming contact with said planar surface said bellows having an inside width;

second means being a bunch of heat conducting strands having a first end connected to said bellows and a second end extending into said second cooling portion and terminating adjacent said apertures, said first end of said bunch of strands having a first width and said second end having a second width wider than said first width, said first width being less than said inside width and said second width being at least as wide as said inside width;

a fluid inlet in said entrance chamber; and

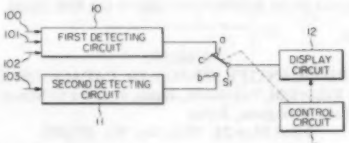
a fluid outlet in said exit chamber.

4,450,506

AUTOMATIC LIGHT-QUANTITY-CONTROL SPEED LIGHT

Hiroshi Hasegawa, Tokyo, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Continuation of Ser. No. 214,886, Dec. 10, 1980, abandoned.
This application Apr. 25, 1983, Ser. No. 486,298
Claims priority, application Japan, Dec. 27, 1979, 54-171444
Int. Cl.³ G03B *15/02*
U.S. Cl. 362—4 **15 Claims**



1. In an automatic light-quantity-control speed light capable of operating in direct and indirect illumination modes, and in which proper light quantity control requires that the quantity of light emitted by the speed light be automatically controlled to be less than a maximum quantity of light which the speed light is capable of emitting in a predetermined time interval, a device for indicating whether or not proper light quantity control for preset exposure factors can be effected in the direct illumination mode and for indicating whether or not proper light quantity control has been effected in the indirect illumination mode, comprising first circuit means for producing a first output signal when a guide number determined by the preset exposure factors is inside of a guide number range in which proper light quantity control can be effected, and for producing a second output signal when said guide number is outside of said guide number range, second circuit means for producing a third output signal when proper light quantity control has been effected during an exposure, and for generating a fourth output signal when proper light quantity control has not been effected during said exposure, display means adapted to be driven from each of said circuit means for providing said indicating, means for driving said display means in a first drive mode in response to said first output signal and third output signal, and for driving said display means in a second drive mode different from said first drive mode in response to said second output signal and fourth output signal, and means for applying output signals from the first circuit means to the driving means when the speed light is in the direct illumination mode and for applying output signals from the second circuit means to the driving means when the speed light is in the indirect illumination mode.

4,450,507

COMPOSITE PHOTOMETRIC METHOD

Myron K. Gordin, Oskaloosa, Iowa, assignor to Mycro-Group Company, Oskaloosa, Iowa

Filed Sep. 15, 1982, Ser. No. 418,451
Int. Cl.³ B60Q 1/00
U.S. Cl. 362—61 5 Claims

1. A method of producing a composite beam of uniform light from a plurality of luminaires, each having defined beams, and each mounted on a luminaire assembly adapted for use with a mobile mounting structure, said method comprising:

determining the field size and description, the number of pole locations, and the fixture configuration for each pole;

ascertaining the required light intensity needed over said field to provide the pre-selected, defined illumination model;

ascertaining the individual beam characteristics of the defined single beam projected by each fixture of said total fixture configuration;

determining the horizintal and vertical coordinates of each such fixture relative to the luminaire cross arm assembly upon which it is mounted;

aligning each of said individual fixtures of said total fixture configuration in accordance with the pre-determined horizontal and vertical coordinates such that when lit, they combine to form a composite photometric beam; and

moving said mobile luminaire assemnly to said field and placing it in location, and aligning said mobile cross arm assebmly by aiming one of said fixtures to a preselected aiming point, and

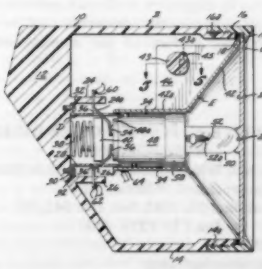
thereafter locking said cross-arm assembly to said pre-aimed position.

4,450,508

SELF CENTERING UNDERGROUND MINE LAMP

James A. Carley, 1502 W. 228th St., Torrance, Calif. 90501

Filed Mar. 21, 1983, Ser. No. 477,180
Int. Cl.³ F21L 15/14
U.S. Cl. 362—105 3 Claims



1. In combination with a miners head piece of the type that includes a housing having a forward and rearward end, a lens secured to said forward end, a tubular socket that projects forwardly in said housing, a plurality of spring loaded, forwardly biased electrical conducting members rearwardly disposed in said socket, a reflector disposed in the forward interior portion of said housing, said reflector including a tubular rearwardly extending extension that has an interior surface and is slidably mounted on said socket, manually operated means for adjustably moving said reflector longitudinally relative to said socket, a self centering lamp for use with said miners head piece, said lamp including:

a. a cylindrical base having a forward and rearward end, said base including at least one electrical conducting filament supported forwardly thereof, and a plurality of electrical contact terminals electrically connected to said filament and in engagement with said electrical conducting members when said base is disposed in said socket;

b. a cylindrical bushing that encircles said bore adjacent said forward end and snuggly and slidably engages said interior surface of said reflector extension, said bushing of sufficient width that said base will not pivot relative to said extension; and

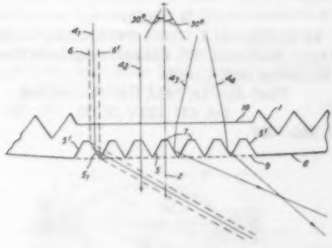
c. a transparent rigid envelope that extends forwardly from said base, said envelop of sufficient length that said forwardly biased electrical conducting members will maintain the forward extremity of said envelope in pressure contact with said lens to at all times maintain said lamp in a centered position relative to said reflector.

4,450,509

LANTERNS FOR AREA LIGHTING

Ivor C. Henry, Enfield, England, assignor to Thorn Emi plc, London, England

Filed Aug. 17, 1982, Ser. No. 408,885
Int. Cl.³ F21S 5/00
U.S. Cl. 362—216 19 Claims



1. A lantern, for an area light, including a transparent or translucent bowl whose exterior includes a substantially central area having, in alternation, regions acting as reflecting prisms to light passing therethrough and substantially flat regions substantially perpendicular to the vertical axis of the lantern.

4,450,510

INCANDESCENT-FLUORESCENT COMPATIBLE LIGHTING PRODUCTS

Ole K. Nilssen, Caesar Dr., Rte. 5, Barrington, Ill. 60010

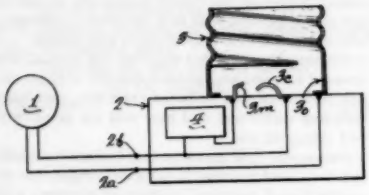
Filed Apr. 5, 1982, Ser. No. 365,553
Int. Cl.³ F21S 3/00
U.S. Cl. 362—221 10 Claims

1. A lighting product adapted to connect with a pair of regular electric utility power lines and to receive, hold, and power a fluorescent lamp or, alternately and interchangeably, an incandescent lamp, said fluorescent lamp having a first and a second fluorescent lamp contact means, said incandescent lamp having a first and a second incandescent lamp contact means, said product comprising:

a socket adapted to receive and hold either the fluorescent

lamp or, alternately and interchangeably, the incandescent lamp and having a first, a second, and a third socket contact means, said first and second socket contact means being adapted to make contact with said first and second fluorescent lamp contact means whenever said fluorescent lamp is inserted into the socket, said first and third socket contact means being adapted to make contact with said first and second incandescent lamp contact means whenever an incandescent lamp is inserted into the socket,

a fluorescent lamp ballasting means, and



connection means adapted to connect said first socket contact means directly with one of said pair of electric utility power lines, said second socket contact means indirectly by way of said ballasting means with the other one of said pair of electric utility power lines, and said third socket means directly with said other one of said pair of electric utility power lines,

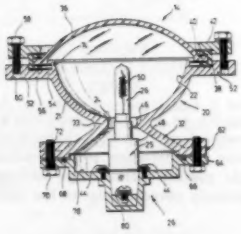
whereby: whenever the fluorescent lamp is placed into the socket, it gets powered from the power line by way of the ballasting means; but, whenever the incandescent lamp is placed into the lamp socket, it gets powered directly from the power line.

4,450,511

SUBMERSIBLE HIGH INTENSITY LAMP

Peter Micha, Richmond Hill, Canada, assignor to Pem Fountain Co., Richmond Hill, Canada

Filed Apr. 13, 1982, Ser. No. 367,805
Int. Cl.³ F21V *29/00*
U.S. Cl. 362—267 **14 Claims**



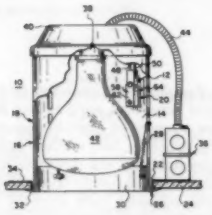
1. A water submersible, hermetically sealed light fixture comprising a light bulb housing having formed therein an interior concave light reflective surface, a support for a light socket mounted on said housing beneath said reflective surface, said support being adapted for sealing engagement with said housing, an elongate high temperature operation light bulb replaceably set in said light socket which is secured to said support, said housing having an aperture at the base of said reflective surface and aligned with said light socket, a transparent cover for the open end of said housing which is sealingly mounted on said housing, said elongate light bulb extending through said aperture into the spaced defined by said reflective surface, the longitudinal axis of said bulb being coincident with the major axis of said concave surface, said housing being in direct contact with the water when in use to cool and maintain said concave light reflective surface as exposed to high temperature produced by said light bulb during operation, said light fixture being adapted to provide different degrees of focused light according to length of said light bulb and positioning of said light socket relative to said concave reflective surface.

4,450,512

ARRANGEMENT FOR MOUNTING A THERMAL PROTECTIVE DEVICE IN A RECESS MOUNTED LIGHTING FIXTURE

Paul J. Kristofek, Hickory Hills, Ill., assignor to McGraw-Edison Company, Rolling Meadows, Ill.

Filed Sep. 13, 1982, Ser. No. 416,880
Int. Cl.³ F21V *29/00*
U.S. Cl. 362—276 **15 Claims**



1. In a lighting fixture adapted for recessed mounting in a ceiling or the like support surface, said lighting fixture including an electrically operated lamp for illuminating an area adjacent said support surface and a thermal protective device connected electrically to said lamp for discontinuing the operation thereof in response to the temperature in an area adjacent the outside of said fixture reaching a predetermined temperature, said thermal protective device including temperature sensing means, a mounting arrangement for mounting said thermal protective device at a preselected location on said lighting fixture, said mounting arrangement including in combination:

a housing in which said electrically operated lamp is mounted, said housing including a side wall having interior and exterior surfaces, said housing being of a predetermined height and having an open end through which light from said lamp emanates, said side wall of said housing defining an aperture therein, said aperture being predeterminedly located along said side wall;

receptacle means for receiving said thermal protective device;

means for mounting said receptacle means on the interior surface of said side wall, said mounting means locating said thermal protective device with said temperature sensing means in alignment with said aperture defined in said side wall, whereby the temperature of the area adjacent said exterior surface of said housing side wall is sensed.

4,450,513

LIGHTING FIXTURE FOR OPPOSITE DIRECTION REFLECTION

Arthur R. Guggemos, Winsted, Minn., assignor to Sterner Lighting Systems Incorporated, Winsted, Minn.

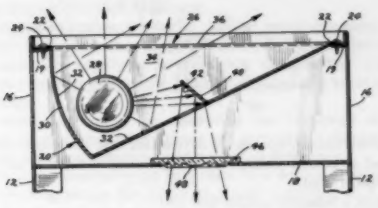
Filed Jan. 25, 1982, Ser. No. 342,233
Int. Cl.³ F21V *7/00*
U.S. Cl. 362—299 **8 Claims**

1. A light fixture comprising:

a primary reflector having a wall, the wall having a reflector surface defining a cavity, the cavity having an opening facing generally in a first direction, the primary reflector being positioned for directing light beams from an illumination source in the first direction and having a second

opening smaller than the cavity defined through the wall; and

a secondary reflector positioned within the cavity at a location so as to direct light beams from the same illumination source in a second direction generally opposite from the first direction through the second smaller opening through the wall of the primary reflector.



4,450,514

SWITCHED MODE POWER SUPPLY

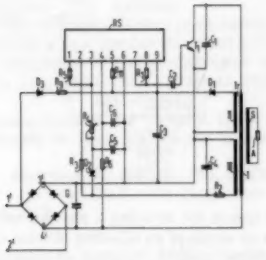
Günther Peruth, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Aug. 20, 1981, Ser. No. 294,431

Claims priority, application Fed. Rep. of Germany, Aug. 25, 1980, 3032034

Int. Cl.³ H02P *13/20*

U.S. Cl. 363—37 **1 Claim**



1. Semiconductor circuit for supplying power to electrical equipment, comprising a transformer having a primary winding connected, via a parallel connection of a collector-emitter path of a transistor with a first capacitor, to both outputs of a rectifier circuit supplied, in turn, by a line a-c voltage; said transistor having a base controlled via a second capacitor by an output of a control circuit acted upon, in turn by the rectified a-c line voltage as actual value and by a reference voltage; said transformer having a first secondary winding to which the electrical equipment to be supplied is connected; said transformer having a second secondary winding with one terminal thereof connected to the emitter of said transistor and the other terminal thereof connected to an anode of a first diode leading to said control circuit; said transformer having a third secondary winding with one terminal thereof connected, on the one hand, via a series connection of a third capacitor with a first resistance, to the other terminal of said third secondary winding and connected, on the other hand, to the emitter of said transistor, the collector of which is connected to said primary winding; a point between said third capacitor and said first resistance being connected to the cathode of a second diode; said control circuit having nine terminals including a first terminal delivering a reference voltage and connected, via a voltage divider formed of a third and fourth series-connected resistances, to the anode of said second diode; a second terminal of said control circuit serving for zero-crossing identification being connected via a fifth resistance to said cathode of said second diode; a third terminal of said control-circuit serving as actual value input being directly connected to a divider point of said voltage divider forming said connection of said first terminal of said control circuit to said anode of said second diode; a fourth terminal of said control circuit delivering a sawtooth voltage being connected via a sixth resistance to a terminal of said primary winding of said transformer facing away from said transistor; a fifth terminal of said control circuit serving as a protective input being connected, via a seventh resistance to the cathode of said first diode and, through the intermediary of said seventh resistance and an eighth resistance, to the cathode of a third diode having an anode connected to an input of said rectifier circuit; a sixth terminal of said control circuit carrying said reference potential and being connected via a fourth capacitor to said fourth terminal of said control circuit and via a fifth capacitor to the anode of said second diode; a seventh terminal of said control circuit establishing a potential for pulses controlling said transistor being connected directly and an eighth terminal of said control circuit effecting pulse control of the base of said transistor being connected through the intermediary of a ninth resistance to said first capacitor leading to the base of said transistor; and a ninth terminal of said control circuit serving as a power supply input of said control circuit being connected both to the cathode of said first diode as well as via the intermediary of a sixth capacitor to a terminal of said second secondary winding as well as to a terminal of said third secondary winding.

4,450,515

BIAS-VOLTAGE GENERATOR

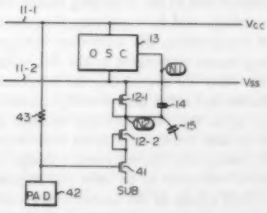
Yoshihiro Takemae, Yokohama; Tomio Nakano; Masao Nakano, both of Kawasaki; Norihisa Tsuge, Kamakura, and Tsuyoshi Ohira, Yokohama, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Jun. 14, 1982, Ser. No. 388,194

Claims priority, application Japan, Jun. 12, 1981, 56-89460

Int. Cl.³ H02M *3/18*; H03K *3/01*

U.S. Cl. 363—60 **14 Claims**



1. A bias-voltage generator having a first and second power sources operatively connectable thereto and applying a bias voltage to a semiconductor substrate having a MOS integrated circuit, comprising:

an oscillator operatively connectable to the first and second power sources;

a charge-pumping circuit operatively connected to the first power source, having a one-way charge path formed between the first power source and the semiconductor substrate and being driven by said oscillator;

a charge-pumping switch, operatively connected between said charge pumping circuit and the semiconductor substrate, in said one-way charge path; and

an external electrode, operatively connected to said charge-pumping switch, for controlling the ON or OFF of said charge-pumping switch.

4,450,516

DEVICE FOR CONTROLLING THE REGULATING FACILITIES IN AN ELECTRIC HIGH-POWER AC-DC CONVERTER

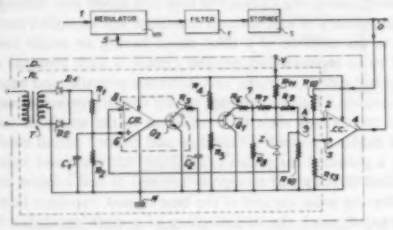
Andre Gérard, Ecquevilly, France, assignor to Compagnie Internationale pour l'Informatique CII-Honeywell Bull (Societe Anonyme), Paris, France

Filed Dec. 23, 1981, Ser. No. 333,769

Claims priority, application France, Dec. 30, 1980, 80 27769

Int. Cl.³ H02P *13/26*

U.S. Cl. 363—84 **7 Claims**



1. For use with an AC-DC converter of the type comprising regulator means having an input connected to an AC voltage network for producing a regulated voltage, filter means connected to an output of the regulator means, and voltage storage means connected to an output of the filter means and providing a DC output voltage from the converter, control apparatus comprising a control comparator responsive to a first voltage related to the output voltage from the converter and to a reference voltage for generating an error signal for controlling the regulator means so as to limit the level of the regulated voltage applied to the filter means upon the first voltage being greater than the reference voltage, the reference voltage having a predetermined nominal value when the converter is normally powered by the AC network, means connected to the AC network for detecting a limit value of the AC voltage of the network corresponding to a cutoff of the AC network and below which the converter is incapable of supplying a useful output voltage to a load, and reference means connected to the control comparator and to the detecting means for generating said reference voltage and for supplying the reference voltage to the control comparator, the reference voltage generating means including means responsive to the AC voltage decreasing to said limit value for decreasing the reference voltage to another predetermined value below said predetermined nominal value and, upon the AC network voltage subsequently increasing above said limit value upon recovery of the network, gradually increasing the reference voltage to said predetermined nominal value so as to limit the regulated voltage applied to the filter means at the moment of recovery to be at most equal to the output voltage from the converter.

4,450,517

CURRENT CONTROL CIRCUIT WITH PARTICULAR APPLICATION IN BIPOLAR CONSTANT CURRENT CONTROL OF STEP MOTORS

Karl E. Sundström, 114, ch de la Montagne, 1224 Chene-Bougeries, Geneva, Switzerland

Filed Jan. 16, 1981, Ser. No. 225,690

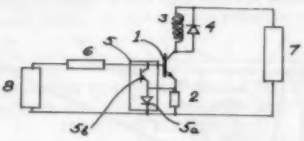
Int. Cl.³ H02M *7/00*

U.S. Cl. 363—124 **2 Claims**

1. A switch mode current control circuit comprising:

a first transistor having a base emitter junction, a first resistor, a coil and a first voltage source, all connected in series;

an optocoupler having a second transistor and a light emitting diode connected thereto, said second transistor connected across said base emitter junction;



a second resistor connected across said base emitter junction and a second voltage source connected to said second resistor; and

a diode connected across said coil.

4,450,518

CONTROL SYSTEM FOR ADJUSTING A PHYSICAL QUANTITY

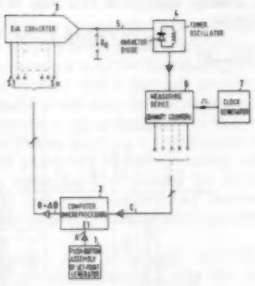
Heinz Klee, Freiburg-Opfingen, Fed. Rep. of Germany, assignor to ITT Industries, Inc., New York, N.Y.

Filed Jun. 15, 1981, Ser. No. 274,039

Claims priority, application Fed. Rep. of Germany, Jul. 4, 1980, 3025358

Int. Cl.³ G05B *15/02*; H03J *5/02*; H03B *3/04*

U.S. Cl. 364—183 **8 Claims**



1. A control system for adjusting a physical quantity to a digital set point by means of an adjusting element of a device having said physical quantity to which an analog adjusting signal is applied comprising:

first means to provide said set point in the form of a digital word A;

second means having an output, a first input coupled to said first means and a second input coupled to said device having said physical quantity to receive a digital word C indicative of the actual value of said physical quantity, said second means converting said word A to a digital word B, comparing said word A with said word C to provide a digital correcting value ΔB and to provide a new word B at said output said new word B equalling the sum of sad word B and said ΔB;

a digital-to-analog (D/A) converter coupled to said output of said second means and said adjusting element to provide said analog adjusting signal proportional to said word B+said ΔB for said adjusting element; and

said D/A converter including

an output line coupled to said adjusting element

a current-to-voltage converter coupled between said output line and summing line of at least two D/A converter sections, a first of said two sections having a finely stepped current range and a second of said two sections having a coarsely stepped current range, the sum of the currents of said finely stepped range being greater than the current of a first step of said coarsely stepped range, the current of

the next adjacent step of said coarsely stepped range being either equal to or twice the current of said first step of said coarsely stepped range.

5. An oscillator arrangement for a receiver tuner comprising:

a voltage controlled oscillator;

a digital-to-analog converter having input terminals and having an output coupled to said voltage controlled oscillator for supplying a frequency determining voltage thereto in response to a first digital word said input terminals;

a measuring circuit for measuring the frequency of said voltage controlled oscillator and providing a second digital word representing said measured frequency;

means for generating an indication of a desired frequency;

processing means for converting said indication to a third digital word, for generating said first word in accordance with said third word, for comparing said third word to said second word and for providing a correction value in accordance with said comparison, said first word being modified in accordance with said correction value;

said D/A converter including:

an output line coupled to said output;

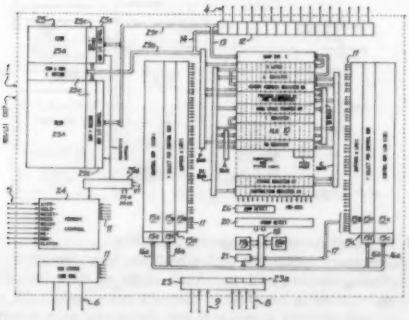
a current-to-voltage converter coupled between said output line and a summing line of at least two D/A converter sections, a first of said two sections having a finely stepped current range and a second of said two sections having a coarsely stepped current range, the sum of the currents of said finely stepped range being greater than the current of a first step of said coarsely stepped range, the current of said first step of said coarsely stepped range being equal to the current of the next adjacent step of said coarsely stepped range.

4,450,519

PSUEDO-MICROPROGRAMMING IN MICROPROCESSOR IN SINGLE-CHIP MICROPROCESSOR WITH ALTERNATE IR LOADING FROM INTERNAL OR EXTERNAL PROGRAM MEMORIES

Karl M. Guttag, Houston, and Gerald E. Laws, Austin, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Nov. 24, 1980, Ser. No. 210,106
Int. Cl.³ G06F 9/00, 13/00, 9/44
U.S. Cl. 364—200 **16 Claims**



6. A microprocessor system comprising:

a main memory (2) containing a plurality of locations defined by an address range,

a central processing unit in a semiconductor unit (1) separate from said main memory (2), said central processing unit including an arithmetic logic unit (10), a plurality of address/data registers, an instruction register (IR) for receiving program instructions for execution by the central processing unit, such program instructions being of a first type and a second type, and control means (15) responsive to a program instruction of said first type in said instruction register to produce a plurality of controls (11) for defining the operation of the arithmetic logic unit and address/data registers in the central processing unit and responsive to a program instruction of said second type in said instruction register to produce an auxiliary control,

an auxiliary storage unit (25A, 25B) containing a plurality of locations defined by a set of addresses within said address range, wherein said set may overlap addresses of said plurality of locations of said main memory,

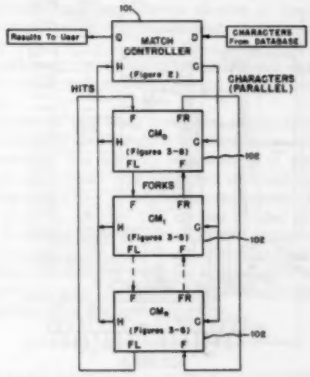
and means (25G,25D,25F) initiated by said auxiliary control from the control means for transferring sequences of program instructions of said first type from such auxiliary storage unit to said instruction register.

4,450,520

METHOD AND SYSTEM FOR MATCHING ENCODED CHARACTERS

Lee A. Hollaar, Salt Lake City, Utah, and Roger L. Haskin, Los Gatos, Calif., assignors to University of Illinois Foundation, Urbana, Ill.

Filed Mar. 11, 1981, Ser. No. 242,789
Int. Cl.³ G06F 7/22
U.S. Cl. 364—200 **24 Claims**



17. A system for detecting matches between strings of input characters from a database and one or more patterns, each pattern comprising elements consisting of tokens, employing a finite state automaton, responsive to said strings of input characters, comprising a plurality of character matchers acting in concert; each character matcher being characterized as capable of existing in one of a plurality of states, each such state having (a) one token from a pattern, to be compared against a current input character, (b) first instructions, which govern transitions to the next state of said character matcher, and (c) second instructions, which force other character matchers into specified states, each character matcher being responsive to one or more memories, comprising control words and storing tokens and instructions for a particular state; each character matcher being further characterized as having at least an initial state, to be occupied by said character matcher at the start of the matching procedure, and an idle state, to be occupied by said character matcher after an unsuccessful comparison between the token specified in the current state of said character matcher and the current input character; the respective states being partitioned among said character matchers to avoid any sequence of input characters requiring any character matcher to be simultaneously in more than one state; said system, for each string of input characters to be matched and a corresponding character matcher, comprising:

(a) reading means, for reading said input characters from said database;

(b) comparison means, for sequentially comparing each input character against the token associated with the current state of said character matcher;

(c) determinant means, for determining a succeeding state of said character matcher based on a successful comparison of the current input character against the token specified in said character matcher's current state; and

(d) forcing means, operative for said character matcher to force other character matchers into specified states.

4,450,521

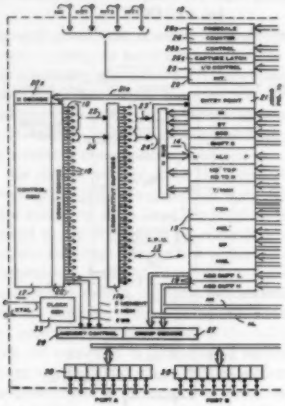
DIGITAL PROCESSOR OR MICROCOMPUTER USING PERIPHERAL CONTROL CIRCUITRY TO PROVIDE MULTIPLE MEMORY CONFIGURATIONS AND OFFSET ADDRESSING CAPABILITY

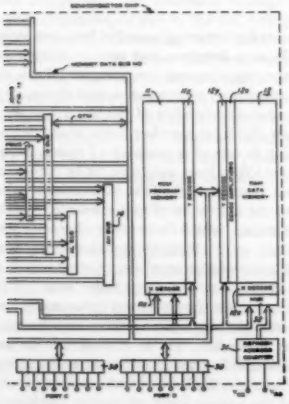
Kevin C. McDonough; John W. Mayn, both of Houston; Gary L. Swoboda, Austin, and Jeffrey D. Bellay, Houston, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Apr. 13, 1981, Ser. No. 253,642

Int. Cl.³ G06F *3/00*

U.S. Cl. 364—200 **21 Claims**





1. An electronic digital processor device constructed in a single-chip semiconductor unit, comprising:

(a) internal read/write memory means for storage of data and internal read-only memory means for storage of instructions which define operations on said data; said read/write and read-only memory means being addressed within a given address range;

(b) arithmetic and logic means for performing said operations on said data;

(c) data register means for temporary storage of said data and address register means for temporary storage of addresses within said given range for accessing said internal read/write and read only memory means;

(d) a plurality of data paths which couple said internal memory means, said arithmetic and logic means, and said register means;

(e) control and timing circuitry connected to receive instructions from said read-only memory means and generating command signals coupled to said internal memory means, to said arithmetic and logic means, to said data paths and to said register means for execution of said instructions,

(f) a peripheral file including a plurality of address locations within said given address range and separate from said data and address register means, a plurality of input/output ports included within said peripheral file, a plurality of directional control registers for the input/output ports included within said peripheral file, an interval timer including a plurality of counter and control registers within said peripheral file, interrupt control circuitry including at least one interrupt control register within said peripheral file and having outputs coupled to said control and timing circuitry, said peripheral file being coupled to said data paths for transferring addresses and data, and receiving command signals from said control and timing circuitry.

4,450,522

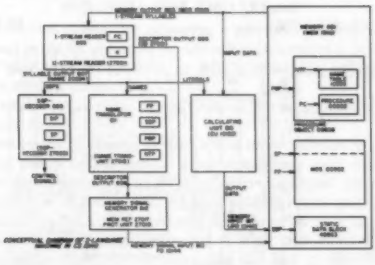
APPARATUS FOR DERIVING ADDRESSES OF DATA USING DISPLACEMENTS FROM BASE ADDRESSES WHICH CHANGE ONLY ON CALL AND RETURN

John F. Pilat, Raleigh, N.C.; Michael S. Richmond, Beaverton, Oreg.; Walter A. Wallach, Jr., San Jose, Calif., and Stephen I. Schleimer, Chapel Hill, N.C., assignors to Data General Corporation, Westboro, Mass.

Filed Sep. 11, 1981, Ser. No. 301,999

Int. Cl.³ G06F *9/00*

U.S. Cl. 364—200 **25 Claims**



1. In a digital computer system including

(A) memory means for performing memory operations including storing and providing items of data including instructions in response to memory commands, each one of said memory commands specifying one said memory operation and an address of one of said items of data in said memory means, and

(B) processor means connected to said memory means for providing said memory commands in response to said instructions,

and wherein

said processor means performs

(1) a call operation for suspending an execution of any sequence of said instructions by said processor means

and commencing a new said execution of any said sequence and

(2) a return operation for terminating said execution of any said sequence and resuming said suspended execution which was suspended to commence said terminated execution,

means for providing said addresses of said items comprising:

(1) architectural base register means accessible to said processor means for storing and outputting an architectural base address of said addresses;

(2) means in said processor means responsive only to said call operation and to said return operation for obtaining a current said architectural base address for said execution being commenced or resumed and loading said architectural base register means with said current architectural base address;

(3) immediate names of said items representing other said items, each said immediate name containing a displacement specifier specifying a displacement from said current architectural base address; and

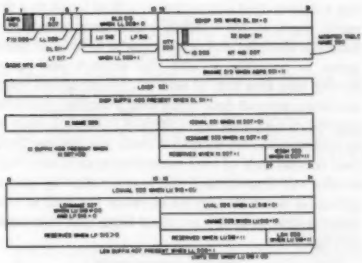
(4) name translation means in said processor means responsive to said immediate names for receiving any said immediate name, using said displacement specified by said displacement specifier in said received immediate name and said current architectural base address to produce said address of said item represented by said received immediate name.

4,450,523

APPARATUS FOR DERIVING THE CURRENT LENGTH OF VARYING-LENGTH DATA ITEMS IN A DIGITAL DATA PROCESSING SYSTEM

John F. Pilat, Raleigh; Anastasia J. Czerniakiewicz, Durham, both of N.C.; David B. Kinder, Portland, Oreg., and Gary Davidian, Raleigh, N.C., assignors to Data General Corporation, Westboro, N.C.

Filed Sep. 11, 1981, Ser. No. 302,264
Int. Cl.³ G06F 9/34
U.S. Cl. 364—200 **17 Claims**



1. In an improved digital computer system including

(A) memory means for performing memory operations including storing and providing items of data including instructions in response to memory commands, each one of said memory commands specifying one said memory operation, an address of one of said items of data in said memory means, and a length of said one data item and

(B) processor means connected to said memory means for providing said memory commands in response to said instructions,

and wherein

said items further include names representing other said items;

said names include table names, each said table name being associated with a name table entry of said items;

said instructions contain said names;

said items further include

varying-length items, each one of said varying length items containing a varying number of data elements of a single size and

current length items associated with said varying-length items, said current length item associated with each of said varying-length items serving to specify the current length of said associated varying-length item; and

said processor means includes name processing means responsive to said names for producing said address and said length of said represented item in response to said name representing said represented item, said name processing means including table name processing means responsive to said table names and to said name table entries associated with said table names for producing said address and said length of said item represented by said table name by processing said associated name table entry,

the improvements comprising:

(1) a current number of elements item of said current length items whose value is the current number of said elements in said associated varying-length item;

(2) an improved said name table entry associated with said table names representing said varying-length items, said improved name table entry including

(a) a current number of elements item specifier specifying said address of said current number of elements item associated with said represented varying-length item and

(b) an element size specifier specifying said single size of said elements in said represented varying-length item; and

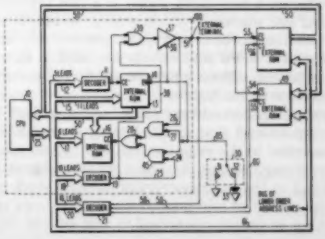
(3) an improved said name processing means responsive to said number of elements item specifier and to said element size specifier for deriving said address of said current number of elements item associated with said represented varying-length item from said current number of elements item specifier, fetching said current number of elements item from said memory means to said processor means, deriving said single size of said elements from said size specifier, and deriving a current said length of said represented varying-length item using said value of said number of elements item and said single size.

4,450,524

SINGLE CHIP MICROCOMPUTER WITH EXTERNAL DECODER AND MEMORY AND INTERNAL LOGIC FOR DISABLING THE ROM AND RELOCATING THE RAM

Joel R. Oberman, Somerville, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Sep. 23, 1981, Ser. No. 304,785
Int. Cl.³ G06F 13/00
U.S. Cl. 364—200 **6 Claims**



1. In a data processor system having a total memory capacity and including an integrated circuit chip having a central processing unit (CPU), an internal ROM, an internal RAM, and first decoder means formed thereon with said first decoder means responsive to addresses supplied thereto for determining

the location of said internal RAM in said total memory capacity, means for disabling said internal ROM from said CPU and for relocating said internal RAM in said total memory capacity and comprising:

means for generating a first control signal having a first and a second state;

said internal ROM reponsive to the first state of said first control signal to become disabled;

first means including first gating means responsive to the first state of said first control signal to disable said internal ROM and to disconnect the output of said first decoder means from said internal RAM;

a second decoder means positioned externally of said chip and responsive to predetermined addresses supplied thereto from said CPU to generate an enabling output signal selectively defining a location of said internal RAM in said total memory capacity;

means for supplying said predetermined addresses from said CPU to said second decoder means; and

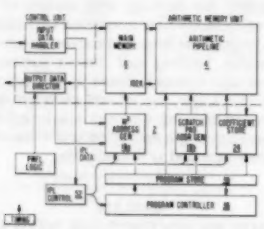
second means including second gating means responsive to the first state of said first control signal to supply the enabling output signal of said second decoder means to said internal RAM to define the location of said internal RAM in said total memory capacity.

4,450,525

CONTROL UNIT FOR A FUNCTIONAL PROCESSOR

Gordon L. Demuth; John E. Hinkle, and J. Thomas Moran, all of Manassas, Va., assignors to IBM Corporation, Armonk, N.Y.

Filed Dec. 7, 1981, Ser. No. 328,167
Int. Cl.³ G06F *9/22, 9/28*
U.S. Cl. 364—200 **69 Claims**



1. A controller for a signal processing computer, comprising:

a microinstruction storage having an address input and a microinstruction word output, for storing microinstruction words, each having a page control field, a microinstruction address stack sequencing pointer field, and a main memory pointer field;

a first clock connected to said microinstruction storage, for producing a first clock signal at a first repetition rate to signal said microinstruction storage to output said microinstruction words at said first repetition rate, each microinstruction word respectively accessed at an address applied to said address input thereof during a corresponding microinstruction interval;

a microinstruction address stack having a clock input connected to said first clock, having a page address input connected to the page control field of said microinstrudtion storage output, having a pointer address input connected to the microinstruction address stack sequencing pointer field of said microinstruction storage output, and having an output connected to said address input of said microinstruction storage, for storing microinstruction word addresses in a plurality of page groups, each page group being accessed by said page address input, each respective page group having a plurality of said microword addresses which are accessed by said pointer address input, said microinstruction address stack selectively accessing new microinstruction words from said microinstruction storage in response to said page field and sequencing pointer field of a current microinstruction word at said first repetition rate;

a main memory address stack having a clock input connected to said first clock, having a page address input connected to said page control field of said microinstruction storage output, having a pointer address input connected to the main memory pointer field of said microinstruction storage output, and having an output connected to an address input of a main data memory, for storing main data memory addresses in a plurality of page groups, each page group being accessed by said page address input thereof, each respective page group having a plurality of said main data memory addresses which are accessed by said pointer address input thereof, said main memory address stack selectively accessing data words from said main data memory in response to said page field and main memory pointer field of said current microinstruction word at said first repetition rate;

said microinstruction words further including a first scratch pad pointer field and a second scratch pad pointer field;

a second clock having an output, for producing a second clock signal at a second repetition rate which is twice said first repetition rate, producing two second clock pulses initiating the first half and the second half, respectively of said microinstruction interval;

a first multiplexer having a clock input connected to said second clock, having a first input connected to the first scratch pad pointer field of said microinstruction storage output, having a second input connected to the second scratch pad pointer field of said microinstruction storage output, and having an output, for connecting said output thereof to said first input thereof during said first half of said microinstruction interval and to said second input thereof during said second half of said microinstruction interval;

a first scratch pad memory having a clock input connected to said second clock, having an address input connected to said output of said first multiplexer, having a data input connected to a data output of said data memory and having a data output connected to a first input to a first arithmetic element, for reading a first data word from a first location therein, and outputting it to said arithmetic element, in response to said first scratch pad pointer field during said first half of said microinstruction interval and writing a second data word into a second location therein applied at said data input thereof from said main memory, in response to said second scratch pad pointer field during said second half of said microinstruction interval;

whereby said first scratch pad is controlled by said microinstruction word to operate at twice the rate at which said microinstructions are accessed from said microinstruction storage.

4,450,526

MONEY PRESET IN AN ELECTRONIC CASH REGISTER

Hiroshi Nakatani, Yamatokoriyama, and Hachizou Yamamoto, Nara, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Sep. 2, 1981, Ser. No. 298,626
Claims priority, application Japan, Sep. 5, 1980, 55-123692
Int. Cl.³ G06F *7/48, 15/20*
U.S. Cl. 364—405 **10 Claims**

1. An electronic cash register comprising:

input means for introducing transaction data into said cash register;

processor means responsive to said input means for conducting arithmetic calculations on said introduced transaction data;

transaction memory means responsive to said processor

means for storing the results of said arithemetic calculations;

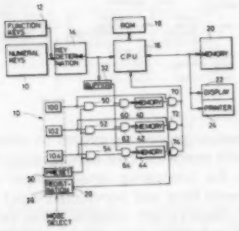
at least one variable money amount entry key means for allowing an operator to select preset numerical amount information;

means for selecting between a preset mode and a normal registration mode; and

preset means for presetting the numerical amount information of said variable money amount key means when said register is in said preset mode, said preset means including,

means for selecting between a preset mode and a normal registration mode; and

preset means for presetting the numerical amount information of,



said variable money amount key means when said register is in said preset mode; said preset means including,

amount memory means for storing the numerical amount information of said variable money amount key means,

means for introducing said numerical amount information into said memory when said cash register is in said preset mode, and

means responsive to actuation of said variable money amount key means when said cash register is in said normal registration mode for transferring said numerical amount information stored in said amount memory means to said processor means.

4,450,527

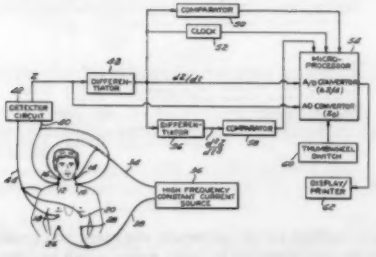
NONINVASIVE CONTINUOUS CARDIAC OUTPUT MONITOR

Bohumir Sramek, Irvine, Calif., assignor to BoMed Medical Mfg. Ltd., Irvine, Calif.

Filed Jun. 29, 1982, Ser. No. 393,429

Int. Cl.[3] **G06F** *15/42;* **H03K** *13/02;* **A61B** *5/02, 5/04*

U.S. Cl. 364—415 **14 Claims**



1. Noninvasive apparatus for continuously monitoring cardiac output of a patient during normal respiratory functions, comprising:

means for producing an electrical signal indicative of thoracic impedance as a function of time;

means for eliminating effects of respiration from the thoracic impedance signal to produce a pulsatile impedance signal indicative of changes in thoracic impedance due to cardiovascular activity as a function of time;

means for processing the pulsatile impedance signal to produce a signal indicative of the maximum rate of change thereof as a function of time;

means for processing the pulsatile impedance signal to produce a signal indicative of ventricular ejection time; and

computing means, responsive to the ventricular ejection time signal and to the maximum rate of change of pulsatile impedance signal, for producing a signal indicative of stroke volume.

4,450,528

METHOD AND APPARATUS FOR CONTROLLING THE OPERATION OF AN INTERNAL COMBUSTION ENGINE

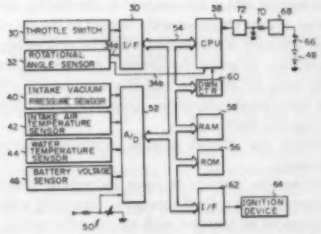
Takehisa Yaegashi, Mishima; Keiji Aoki, and Kenzo Hashikawa, both of Susono, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Mar. 27, 1981, Ser. No. 248,444

Claims priority, application Japan, Mar. 31, 1980, 55-40164

Int. Cl.[3] **F02B** *3/12;* **F02P** *17/00*

U.S. Cl. 364—431.05 **10 Claims**



6. An apparatus for controlling the operation of an internal combustion engine, comprising:

means for detecting the actual operating condition of said engine and for producing at least one first electrical signal indicating said detected operating condition of said engine;

storage means for preliminarily storing a plurality of constant values;

voltage instructing means for generating an instruction voltage which was predetermined before operating said engine and maintaining said instruction voltage constant during engine operation, said voltage instructing means operating independently of said detecting means;

means for converting said predetermined instruction voltage generated by said voltage instructing means into a second electrical signal in binary form;

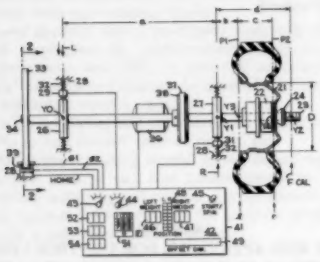
processing means for (1) determining a calculation coefficient by processing one of said constant values stored in said storage means in accordance with said second electrical signal, and (2) arithmetically calculating at least one value corresponding to a setting for adjusting the operation of said engine from said first electrical signal and said calculation coefficient; and

means for controlling the operation of said engine in response to said value corresponding to the setting.

4,450,529
METHOD AND APPARATUS FOR DETERMINING ENCODER ACCURACY MARGIN IN A WHEEL BALANCER

Jerry M. Hill, North Little Rock, and Joel T. Lipe, Little Rock, both of Ark., assignors to FMC Corporation, Chicago, Ill.

Filed Jul. 28, 1980, Ser. No. 172,723
Int. Cl.[3] G01M 1/22; G06F 15/20
U.S. Cl. 364—508 17 Claims



1. A method of determining a shaft encoder operating characteristics wherein the encoder provides angular position information outputs indicative of the position of a shaft which is mounted for rotation in a framework and which is driven by a motor coupled thereto, wherein a display is provided and a processor is included to monitor the encoder outputs and to provide signals which are coupled to the display and which are indicative of data obtained with respect to the encoder outputs, wherein memory is associated with the processor, such memory operating to store the angular position information, and wherein such information includes a reference indication and angular increment indications, comprising the steps of

rotating the shaft,

retrieving the stored angular position information from memory,

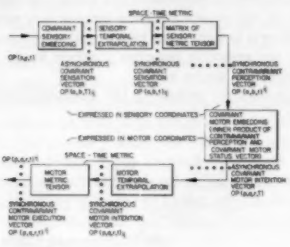
retrieving the current angular increment indications from memory during shaft rotation, comparing current angular increment indications with stored information, and updating the stored angular position information with the current angular increment and reference indication information where the comparison is indicative of change therein, so that when the stored angular position information is coupled to the display, indications are provided thereby of the number of angular increments between reference indications and of the current encoder angular position.

14. Apparatus for portraying the operation of an off-the-car wheel unbalance measuring system having a rotationally driven wheel mounting shaft supported in a frame or pedestal, a pair of force transducers mounted in the pedestal in mechanical communication with and spaced along the shaft, a shaft encoder providing a "home" reference pulse once each shaft revolution and a plurality of angular shaft position increment pulses for each shaft revolution in the form of a dual signal providing encoder states which have a predetermined phase relationship, structure adapted to receive and retain a rotating body to be balanced on the shaft, a shaft drive motor coupled to the shaft and operating to drive the shaft rotationally, a first display and a second display, comprising random access memory receiving current encoder states, and a shaft angular increment count register, means coupling the first display to said random access memory to display the current encoder states, and means coupling the second display to said angular increment count register to display the current shaft position, whereby encoder angular position relative to the shaft as well as encoder electro-optical integrity is monitored.

4,450,530
SENSORIMOTOR COORDINATOR

Rodolfo R. Llinas, and Andras J. Pellionisz, both of New York, N.Y., assignors to New York University, New York, N.Y.

Filed Jul. 27, 1981, Ser. No. 286,979
Int. Cl.[3] G06G 7/60; G06F 15/42
U.S. Cl. 364—513 15 Claims



1. An information processing system to coordinate sensory input signals with motor-effector means, using oblique systems of coordinates for processing sensory input information in covariant vectorial form and providing output motor-effector information in contravariant vectorial form, comprising:

(a) covariant embedding means for expressing sensory input signals in an n-dimensional vector by N components in a covariant vectorial expression, where N is greater than n;

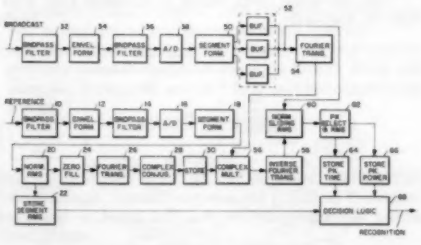
(b) covariant-contravariant transformation means for obtaining contravariant expressions from said covariant vectorial expression, said transformation means expressible as a tensorial transformation; and

(c) contravariant vectorial expression means for providing output information to a motor effector means relative to an external invariant.

4,450,531
BROADCAST SIGNAL RECOGNITION SYSTEM AND METHOD

Stephen C. Kenyon, Stafford, Va.; Laura J. Simkins, Clarksburg, Md.; Leroy L. Brown, Springfield, and Richard Sebastian, Lorton, both of Va., assignors to Ensco, Inc., Springfield, Va.

Filed Sep. 10, 1982, Ser. No. 416,664
Int. Cl.[3] G06J 1/00; H04B 1/00
U.S. Cl. 364—604 25 Claims



1. A method for the automatic electronic recognition of a program unit broadcast by radio waves which includes:

a. processing said program unit to obtain a plurality of digitized reference signal segments;

b. successively processing a broadcast signal to generate successive digitized broadcast signal segments;

c. correlating a plurality of successive digitized broadcast signal segments with an equal number of digitized reference signal segments to obtain correlation function peaks for each resultant correlation segment, and

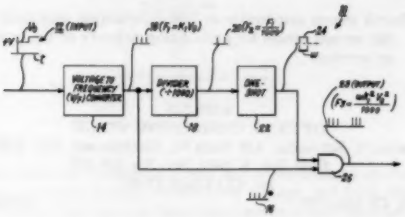
d. comparing the spacing between correlation function peaks for each correlation segment to determine whether such spacing is substantially equal to the reference signal segment length.

4,450,532

VOLTAGE TO FREQUENCY CONVERTER

William A. Massey, Mt. Holly, N.J., assignor to General Electric Company, King of Prussia, Pa.

Filed Apr. 19, 1982, Ser. No. 369,441
Int. Cl.³ H03L 7/00
U.S. Cl. 364—703 **5 Claims**



1. A circuit arrangement for receiving an applied, analog type electrical signal V_0 and generating a pulse train output signal whose average frequency F_3 is proportional to the square of the applied analog type electrical signal V_0, said circuit arrangement comprising:

(a) analog to frequency converter means for converting said applied analog signal V_0 to a first digital output signal comprising a string of pulses of a frequency $F_1 = K_1 V_0$, where K_1 is a predetermined analog to digital conversion constant;

(b) means for dividing said first output signal by a predetermined divisor D so as to develop a second output signal comprising a string of pulses whose frequency is $F_2 = F_1/D$; said frequency F_2 being relatively lower than said frequency F_1;

(c) means responsive to said second output signal for generating a third output signal having a pulse rate whose frequency is equal to said frequency F_2 of said second output signal and a pulse width of a predetermined duration W which is less than the period of the second output signal;

(d) means receiving said first and third output signals and responsive to coincidence between said first and third output signals for developing a pulse in response to each such coincidence, thereby generating a train of pulses whose average frequency F_3 equals $(W K_1^2 V_0^2)/D$, thus rendering F_3 proportional to V_0^2.

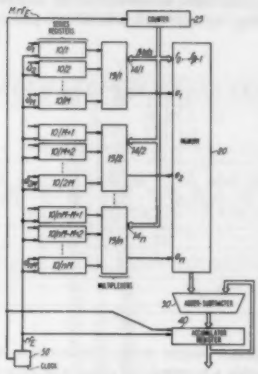
4,450,533

DISTRIBUTED ARITHMETIC DIGITAL PROCESSING CIRCUIT

Jean-Pierre Petit, 16, rue Le Peletier, 22220 Treguier, and Xavier Maitre, Rte. de Pennker, Le Bourg, 22300 Lannion, both of France

Filed Aug. 17, 1981, Ser. No. 293,367
Claims priority, application France, Aug. 27, 1980, 80 18580
Int. Cl.³ G06F 15/31
U.S. Cl. 364—724 **3 Claims**

1. A digital processing circuit forming a weighted sum of digital signals, comprising n groups each of M series registers into which are introduced signals to be processed, n multiplexers each with M inputs and one output, said M inputs of each multiplexer being connected to the outputs of said M series registers of one of the groups, a memory containing precalculated quantities characteristic of the weighted sum to be formed, said memory having a capacity of $2^{\beta+n}$ words distributed into different blocks, a modulo M counter with β outputs, said memory having β inputs for addressing the different blocks ($f_0, f_1 \ldots, f_{\beta-1}$) connected to the β outputs of said counter and n inputs for addressing a word into a block ($e_1, e_2 \ldots e_n$) connected to the outputs of the n multiplexers, an adder-subtracter connected to said memory, an accumulator register connected to said adder-subtracter and a clock actuating said counter, said series registers and said accumulator register, the number M being less than 2^{β}, said memory being subdivided into $M-(2^{\beta}-M)$ blocks each of 2^n words and into $(2^{\beta}-M)$ blocks each of 2^{n+1} words, said blocks being selected by the bits supplied by the outputs of said counter, said digital processing circuit comprising supplementary series registers, whose number is at the most equal to $2^{\beta}-M$, said supplementary series registers receiving supplementary signals to be processed, said digital processing circuit also comprising a multiplexing means having inputs connected to the outputs of said supplementary series registers, as well as to the outputs of said counter which can supply bits which are not significant with respect to the addressing of the memory blocks, said multiplexing means being controlled by the outputs of said counter indicating the appearance of the non-significant bits, certain of the addressing inputs of the memory blocks being connected to the outputs of said multiplexing means in such a way that they are connected across said multiplexing means either to said supplementary series registers when these non-significant bits appear at the output of said counter or to said counter when such bits are absent.



4,450,534

MULTIPROCESSOR WITH DEDICATED DISPLAY

Duane Solimeno, Newington, Conn.; Sammy K. Brown, Midland, Tex.; Peter L. Koeppen, Houston, Tex., and Gerald Rogers, Sugarland, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed May 14, 1981, Ser. No. 263,795
Int. Cl.³ G06F 13/00
U.S. Cl. 364—900 **4 Claims**

1. An electronic displaying apparatus comprising:

input means;

display means;

an electronic digital processor system dedicated to control the display means and including;

memory means for storing of display data and commands which define operations on said data;

arithmetic and logic means for performing said operations on said data;

first and second independent and simultaneously operable central processing units for executing said commands on said data,

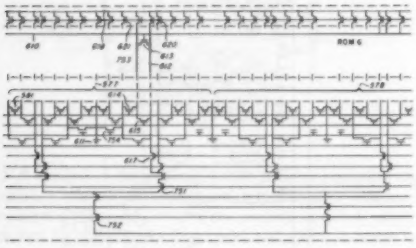
the first independent and simultaneously operable central

processing unit for updating data from the input means, and

the second independent and simultaneously operable central processing unit for performing display operations on the display means;

control circuitry for alternately connecting the first independent and simultaneously operable central processing unit to said memory means while connecting the second central processing unit to said arithmetic and logic means and connecting the first independent and simultaneously operable central processing unit to the arithmetic and logic means while connecting the second independent and simultaneously operable processing unit to the memory means;

first processor input means connected to said input means for providing input to said first central processing unit;



first processor output means connected to said input means to provide a terminal for acknowledging the reception of input data;

second processor output means connected to said display means for displaying output data from said second central processing unit;

a plurality of data paths that connect said first central processing unit via said control circuitry to said memory means, said arithmetic and logic means, said first input means, said first processor output means and said control circuitry;

and connect said second central processing unit via said control circuitry to said memory means, said arithmetic and logic means, said control circuitry and said second processor output means.

4,450,535

SYSTEM AND METHOD FOR AUTHORIZING ACCESS TO AN ARTICLE DISTRIBUTION OR SERVICE ACQUISITION MACHINE

Bertrand de Pommery, St Nom la Breteche, and Michel Ugon, Maurepas, both of France, assignors to Compagnie Internationale pour l'Informatique CII-Honeywell Bull (Societe Anonyme), Paris, France

Filed Sep. 15, 1981, Ser. No. 302,621

Claims priority, application France, Sep. 16, 1980, 80 19951

Int. Cl.³ G06F *15/20*

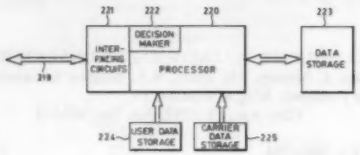
U.S. Cl. 364—900 **19 Claims**

1. System for authorizing the distribution of articles or services comprising:

first means for receiving first and second detachable data carriers, each data carrier having processing means, data storage means, decision-making means and interfacing circuits;

second means for processing information from the first and second detachable data carriers;

third means for providing bi-directional communication between the first and second detachable data carriers and said second means, the second detachable data carrier having means necessary for enabling said bi-directional communication between the first detachable data carrier and said second means; and



fourth means responsive to said information processed by the second means for authorizing delivery of the articles or services.

4,450,536

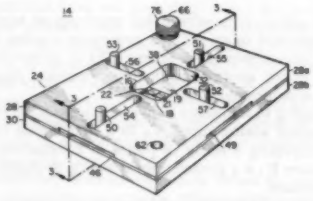
OPTICAL COMPOSING STAGE

Warren E. Schroeder, 134 Main St., Hackensack, N.J. 07601

Filed Feb. 5, 1982, Ser. No. 346,207

Int. Cl.³ G03B *27/62*

U.S. Cl. 355—75 **4 Claims**



1. In an optical composing stage having a variable-area aperture for successively presenting selected portions of an object transparency mounted thereon for imaging by transmission therethrough of light from an illuminating light source incident on one side of the aperture onto an optical recording medium by means of a lens system having an angle of view for viewing light transmitted through to the other side of the aperture, the improvement comprising:

a movable aperture-defining blade, having a light source proximal surface, a light source distal surface and a leading edge; the leading edge of which is shaped so that diffused light incident thereon from the light source will be directed out of the angle of view of the lens system, whereby image flaring due to edge reflection is prevented.

4,450,537

MONOLITHICALLY INTEGRATED READ-ONLY MEMORY

William G. Oldham, El Cerrito, Calif., assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

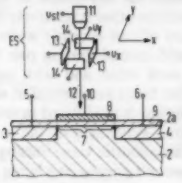
Filed Aug. 19, 1981, Ser. No. 294,303

Int. Cl.³ G11C *11/40, 7/00*

U.S. Cl. 365—217 **8 Claims**

1. A monolithically integrated read-only memory system, comprising: a plurality of word lines, a plurality of read lines which cross the word lines to form intersections; the read lines being connected via load elements with a supply voltage; field effect transistors connected to the read and word lines at the intersections, the transistors being connected to be selectable via the word lines and to function as coupling elements between the read lines and a circuit point carrying a reference potential; the field effect transistors being formed of gate insulating layers on a semiconductor body connected to a reference voltage; means for selectively altering a charge state of

the gate insulating layers of the transistors at certain predetermined intersections so as to program the entire memory system prior to use and application of specific control voltages to the intersection transistors in read-only memory fashion, the altered charge states changing a threshold voltage of the transistor so as to determine whether or not it can be employed as a coupling element; and said means for selectively altering comprising a scanning electron beam which scans over all of the intersection transistors on the semiconductor body along individual lines parallel to one another and which is activated only



when the beam is scanning across said predetermined intersections, a current density, acceleration voltage, and local influence time of the electron beam being selected such that charge carrier pairs form in the gate insulating layer, negative charge carriers of the pairs flowing off to the semiconductor body connected to the reference voltage while positive charge carriers of the pairs remain in the gate insulating layer and charge it positively, a size of the positive charging being essentially determined by a product of the current density and influence duration of the electron beam.

4,450,538

ADDRESS ACCESSED MEMORY DEVICE HAVING PARALLEL TO SERIAL CONVERSION

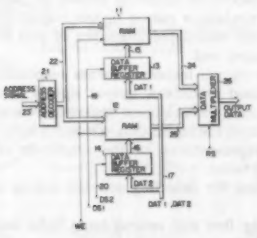
Hisatoshi Shirasaka, Tokyo, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Continuation of Ser. No. 102,836, Dec. 12, 1979. This application Feb. 5, 1982, Ser. No. 346,145

Claims priority, application Japan, Dec. 23, 1978, 53/160706; Dec. 23, 1978, 53/160707; Dec. 23, 1978, 53/160708

Int. Cl.³ G11C *13/00*

U.S. Cl. 365—219 **10 Claims**



1. A memory device for receiving, storing, and outputting data groups, said memory device comprising:

a plurality of registers, each of said registers for receiving and storing a data group and for outputting a said stored data group following the storing thereof;

a pluarlity of memory means for addressably storing and outputting data groups, each of said memory means having individually addressable memory locations and each memory means being associated with a different one of said registers for receiving said data groups outputted by said associated register;

address control means for supplying in parallel the same address information to each of said memory means to cause each of said memory means to output the data groups stored in the individually addressable memory locations designated by said supplied address information; and

parallel-to-serial converting means coupled to said plurality of memory means for receiving data groups outputted therefrom and for selectively supplying said received data groups in a serial manner.

4,450,539

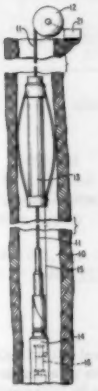
APPARATUS FOR MEASURING THE RELATIVE POSITION OF A DOWNHOLE TOOL IN A BORE HOLE

Gary R. Bright, Tulsa, Okla., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Filed Jul. 29, 1981, Ser. No. 287,999

Int. Cl.³ G01V *1/00, 9/00*

U.S. Cl. 367—35 **5 Claims**



1. An apparatus for determining the relative distance between points at differing elevations within a segment of a bore hole comprising: a bore hole wall engaging anchor detachably connected to a downhole tool carried by a wireline; means controllable from the surface for detaching said anchor from said downhole tool to permit vertical separation of said tool and anchor, said anchor remaining stationary in said bore hole; a distance sensing cable carried by a reel attached to the tool and having its free end attached to said anchor; and an electrical pulse transmitter actuated as the sensing cable pays off of said reel and connected through a pair of conductors in the wireline to a distance indicator located at the surface.

4,450,540

SWEPT ENERGY SOURCE ACOUSTIC LOGGING SYSTEM

A. J. Mallett, Houston, Tex., assignor to Halliburton Company, Duncan, Okla.

Continuation of Ser. No. 129,952, Mar. 13, 1980, abandoned. This application Aug. 20, 1982, Ser. No. 410,165

Int. Cl.³ G01V *1/40, 1/28*

U.S. Cl. 367—41 **3 Claims**

1. A well logging system for measuring and recording the acoustic energy propagation characteristic of earth formations penetrated by a well borehole comprising:

a fluid tight hollow body member sized and adapted for passage through a well borehole;

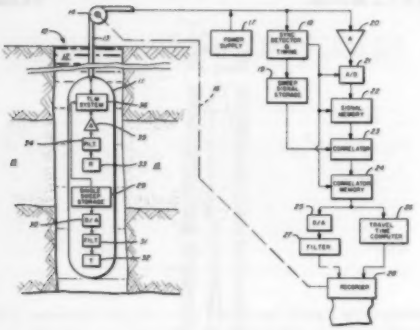
means in said body member for repetitively generating swept frequency acoustic energy outputs having a linearly varying range of frequencies from a lowest frequency of approximately two kilohertz to a highest frequency of approximately twelve kilohertz in a characteristic pattern,

said pattern having a duration of approximately four milliseconds;

means for digitizing said characteristic swept frequency signal and for providing a digital signal representative of said characteristic signal at said generating means;

receiver means longitudinally spaced from said generating means by a distance of from eight to twelve feet in said body member, for detecting acoustic energy propagated from said generating means through the borehole and earth formations in the vicinity of the borehole and for generating digital signals representative of said detected acoustic energy;

means for cross correlating said digital signal representative of said characteristic signal at said generating means and said digital signal representative of said detected acoustic energy and for providing a correlator output signal repre-



sentative of the arrival at said receiver means of different modes of propagation of acoustic energy in the borehole and earth formations in the vicinity of the borehole;

computer means responsive to said correlator output signal for deriving therefrom measurements of the speed of propagation of said different modes of propagation of acoustic energy in the earth formations in the vicinity of the well borehole;

means for recording said measurements of the speed of propagation of said different modes of acoustic energy as a function of borehole depth, thereby providing on a record medium a well log of speed of propagation of different modes of acoustic energy; and

means for recording as a function of borehole depth said correlator output signal, thereby providing a well log indicative of the time of arrival at said receiver means of different modes of propagation of acoustic energy.

4,450,541

BIAS COMPENSATED OPTICAL GRATING HYDROPHONE

Byron W. Tietjen, Liverpool, N.Y., assignor to General Electric Company, Syracuse, N.Y.

Filed Dec. 31, 1981, Ser. No. 336,252
Int. Cl.³ H04R *23/00*
U.S. Cl. 367—149 **9 Claims**

1. A hydrophone comprising:

a housing including a chamber closed by acoustic wave sensing means movable in response to an acoustic wave incident thereon;

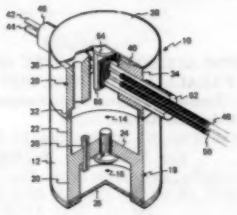
means disposed within said chamber for transmitting first and second light beams therein;

first and second light beam receiving means disposed within said chamber and having said first and second light beams respectively directed thereon;

first intensity modulating means comprising a first pair of optical gratings of which one is coupled to said acoustic wave sensing means for movement in accordance with motion thereof and the other is relatively fixed so as not to move with motion of said acoustic wave sensing means, the gratings of said first grating pair being in optical alignment with each other and with said first light beam whereby that beam as received at said first light beam receiving means is modulated in intensity in accordance with relative movement of the gratings resulting from motion of said acoustic wave sensing means;

second intensity modulating means comprising a second pair of optical gratings one of which is coupled to said acoustic wave sensing means for movement in accordance with motion thereof and the other is relatively fixed so as not to move with motion of said acoustic wave sensing means, the gratings of said second grating pair being in optical alignment with each other and with said second light beam whereby that beam as received at said second light beam receiving means is modulated in intensity in accordance with relative movement of the gratings resulting from motion of said acoustic wave sensing means, the two gratings of said second grating pair being positioned relative to each other with a spatial displacement of 90 degrees from the relative position of the two gratings of said first grating pair whereby the modulation of said second beam by said second grating pair is phase displaced by 90 degrees with respect to the modulation of said first beam by said first grating pair;

first and second photodetector means respectively connected to said first and second beam receiving means for detecting said first and second light beams as modulated by the grating pair through which each beam is received



at its respective receiving means, to provide first and second modulator output signals respectively representative of the modulated intensities of said first and second light beams; and

a detector circuit including means responsive to said first and second modulator output signals to select the one thereof then within a linear region of its modulation and to derive from the signal thus selected a hydrophone output signal representative of the amplitude of the incident acoustic wave.

7. A method for detecting acoustic waves comprising the steps of:

transmitting first and second input light beams through a hydrophone;

modulating the intensity of said first input light beam in accordance with a received acoustic wave to produce a first modulated output light beam;

modulating the intensity of said second input light beam in accordance with said received acoustic wave to produce a second modulated output light beam the modulation of which has a 90 degree phase displacement with respect to said first output light beam;

detecting each of said first and second output light beams;

converting said first output light beam into a first electrical output signal;

converting said second output light beam into a second electrical output signal; and

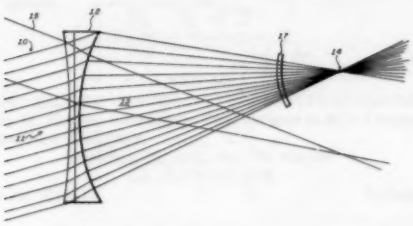
selecting as an output signal indicative of the presence of an acoustic wave the one of said first and second electrical

output signals which is then within a linear region of its modulation.

4,450,542
MULTIPLE BEAM LENS TRANSDUCER FOR SONAR SYSTEMS

Jacob A. Kritz, Westbury, N.Y., assignor to Sperry Corporation, New York, N.Y.

Filed Mar. 5, 1982, Ser. No. 354,973
Int. Cl.³ H04R 17/00
U.S. Cl. 367—150 12 Claims



1. An apparatus for transmitting and receiving a plurality of sonar beams comprising:

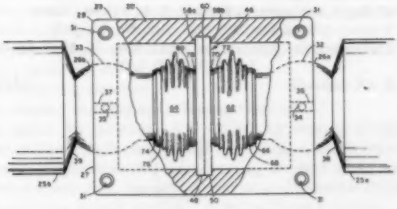
lens means having a central axis and a focal surface, for converting incident plane sound waves to sound waves that converge at a focal region in said focal surface such that plane waves incident in different predetermined directions converge to different focal regions, and for converting sound waves emitted from said focal regions to plane sound waves radiating from said lens means in said predetermined directions, and

a plurality of electroacoustic transducers, configured as segments of spherical shells, said spherical shells having centers in said focal regions, said transducers disposed between said lens means and said centers to receive focused sound waves.

4,450,543
SECTIONALIZED MARINE SEISMIC CABLE

Walter P. Neeley, Irving, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Mar. 19, 1982, Ser. No. 359,960
Int. Cl.³ G01V 1/38
U.S. Cl. 367—154 2 Claims



1. A marine seismic cable comprising:

a. a plurality of marine seismic cable sections,

b. a plurality of articulated connector assemblies joining said cable sections to form a sectionalized marine seismic cable, each articulated connector assembly comprising:

i. a housing having first and second sockets provided in opposite ends thereof;

ii. a pair of diametrically opposed grooves in the inner surface of each of said first and second sockets and extending longitudinally relative to said housing;

iii. a first strain member to which one end of a first seismic cable section is affixed and having a ball-like member at one end thereof;

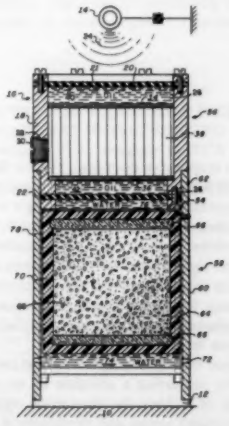
iv. a second strain member to which one end of a second seismic cable section is affixed and having a ball-like member at one end thereof; and

v. a pair of pins extending from opposite sides of said ball-like members of said first and second strain members and extending into the grooves in the first and second sockets of said housing, whereby two degrees of freedom of movement of said first and second cable sections relative to one another is permitted during seismic exploration operations, a first degree of said movement being effected by rotational movement of said pins within said grooves and a second degree of said movement being effected by translational movement of said pins along said grooves.

4,450,544
ABSORPTIVE SONAR BAFFLE

Alfred Denaro, Commack, and George Rand, Franklin Square, both of N.Y., assignors to Sperry Corporation, New York, N.Y.

Filed Nov. 16, 1981, Ser. No. 321,851
Int. Cl.³ H04R 17/00
U.S. Cl. 367—176 12 Claims



1. A baffle for absorbing acoustical energy comprising:

fluid containment means having a sidewall and opposed end walls for defining therein a first fluid chamber, one of said end walls comprising a first elastic diaphragm,

viscous fluid contained within said first fluid chamber,

first screen member disposed within said first fluid chamber defining a first fluid region between said first screen and said first elastic diaphragm, said first screen member having a plurality of restricted orifices therethrough which communicate with said first fluid region,

second screen member disposed within said first fluid chamber having a plurality of restricted orifices therethrough,

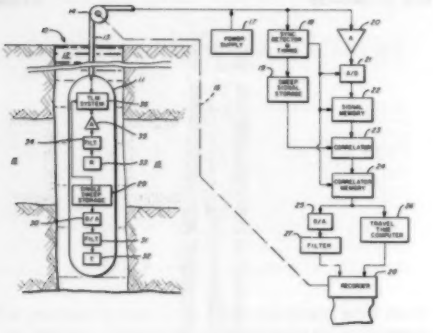
channel means positioned between said first and second screen members having a plurality of fluid passages for controlling flow of said viscous fluid between said orifices of said first and second screen members.

said pattern having a duration of approximately four milliseconds;

means for digitizing said characteristic swept frequency signal and for providing a digital signal representative of said characteristic signal at said generating means;

receiver means longitudinally spaced from said generating means by a distance of from eight to twelve feet in said body member, for detecting acoustic energy propagated from said generating means through the borehole and earth formations in the vicinity of the borehole and for generating digital signals representative of said detected acoustic energy;

means for cross correlating said digital signal representative of said characteristic signal at said generating means and said digital signal representative of said detected acoustic energy and for providing a correlator output signal repre-



sentative of the arrival at said receiver means of different modes of propagation of acoustic energy in the borehole and earth formations in the vicinity of the borehole;

computer means responsive to said correlator output signal for deriving therefrom measurements of the speed of propagation of said different modes of propagation of acoustic energy in the earth formations in the vicinity of the well borehole;

means for recording said measurements of the speed of propagation of said different modes of acoustic energy as a function of borehole depth, thereby providing on a record medium a well log of speed of propagation of different modes of acoustic energy; and

means for recording as a function of borehole depth said correlator output signal, thereby providing a well log indicative of the time of arrival at said receiver means of different modes of propagation of acoustic energy.

4,450,541

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Int. Cl.³ H04R *23/00*

U.S. Cl. 367—149 **9 Claims**

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a housing including a chamber closed by acoustic wave sensing means movable in response to an acoustic wave incident thereon;

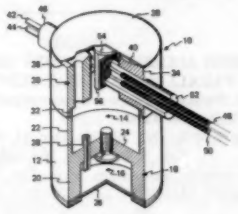
means disposed within said chamber for transmitting first and second light beams therein;

first and second light beam receiving means disposed within said chamber and having said first and second light beams respectively directed thereon;

first intensity modulating means comprising a first pair of optical gratings of which one is coupled to said acoustic wave sensing means for movement in accordance with motion thereof and the other is relatively fixed so as not to move with motion of said acoustic wave sensing means, the gratings of said first grating pair being in optical alignment with each other and with said first light beam whereby that beam as received at said first light beam receiving means is modulated in intensity in accordance with relative movement of the gratings resulting from motion of said acoustic wave sensing means;

second intensity modulating means comprising a second pair of optical gratings one of which is coupled to said acoustic wave sensing means for movement in accordance with motion thereof and the other is relatively fixed so as not to move with motion of said acoustic wave sensing means, the gratings of said second grating pair being in optical alignment with each other and with said second light beam whereby that beam as received at said second light beam receiving means is modulated in intensity in accordance with relative movement of the gratings resulting from motion of said acoustic wave sensing means, the two gratings of said second grating pair being positioned relative to each other with a spatial displacement of 90 degrees from the relative position of the two gratings of said first grating pair whereby the modulation of said second beam by said second grating pair is phase displaced by 90 degrees with respect to the modulation of said first beam by said first grating pair;

first and second photodetector means respectively connected to said first and second beam receiving means for detecting said first and second light beams as modulated by the grating pair through which each beam is received



at its respective receiving means, to provide first and second modulator output signals respectively representative of the modulated intensities of said first and second light beams; and

a detector circuit including means responsive to said first and second modulator output signals to select the one thereof then within a linear region of its modulation and to derive from the signal thus selected a hydrophone output signal representative of the amplitude of the incident acoustic wave.

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modulating the intensity of said second input light beam in accordance with said received acoustic wave to produce a second modulated output light beam the modulation of which has a 90 degree phase displacement with respect to said first output light beam;

detecting each of said first and second output light beams;

converting said first output light beam into a first electrical output signal;

converting said second output light beam into a second electrical output signal; and

selecting as an output signal indicative of the presence of an acoustic wave the one of said first and second electrical

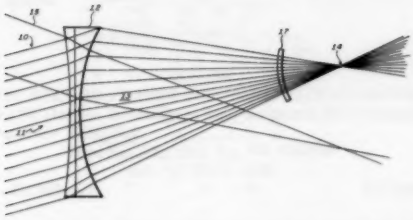
output signals which is then within a linear region of its modulation.

4,450,542

MULTIPLE BEAM LENS TRANSDUCER FOR SONAR SYSTEMS

Jacob A. Kritz, Westbury, N.Y., assignor to Sperry Corporation, New York, N.Y.

Filed Mar. 5, 1982, Ser. No. 354,973
Int. Cl.³ H04R *17/00*
U.S. Cl. 367—150 **12 Claims**



1. An apparatus for transmitting and receiving a plurality of sonar beams comprising:

lens means having a central axis and a focal surface, for converting incident plane sound waves to sound waves that converge at a focal region in said focal surface such that plane waves incident in different predetermined directions converge to different focal regions, and for converting sound waves emitted from said focal regions to plane sound waves radiating from said lens means in said predetermined directions, and

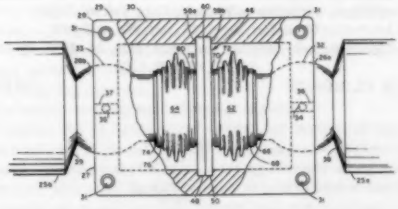
a plurality of electroacoustic transducers, configured as segments of spherical shells, said spherical shells having centers in said focal regions, said transducers disposed between said lens means and said centers to receive focused sound waves.

4,450,543

SECTIONALIZED MARINE SEISMIC CABLE

Walter P. Neeley, Irving, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Mar. 19, 1982, Ser. No. 359,960
Int. Cl.³ G01V *1/38*
U.S. Cl. 367—154 **2 Claims**



1. A marine seismic cable comprising:

a. a plurality of marine seismic cable sections,

b. a plurality of articulated connector assemblies joining said cable sections to form a sectionalized marine seismic cable, each articulated connector assembly comprising:

i. a housing having first and second sockets provided in opposite ends thereof;

ii. a pair of diametrically opposed grooves in the inner surface of each of said first and second sockets and extending longitudinally relative to said housing;

iii. a first strain member to which one end of a first seismic cable section is affixed and having a ball-like member at one end thereof;

iv. a second strain member to which one end of a second seismic cable section is affixed and having a ball-like member at one end thereof; and

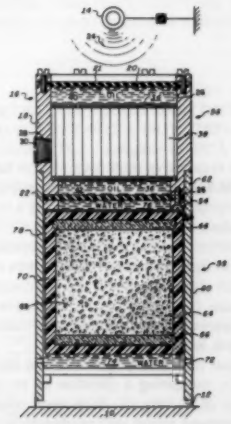
v. a pair of pins extending from opposite sides of said ball-like members of said first and second strain members and extending into the grooves in the first and second sockets of said housing, whereby two degrees of freedom of movement of said first and second cable sections relative to one another is permitted during seismic exploration operations, a first degree of said movement being effected by rotational movement of said pins within said grooves and a second degree of said movement being effected by translational movement of said pins along said grooves.

4,450,544

ABSORPTIVE SONAR BAFFLE

Alfred Denaro, Commack, and George Rand, Franklin Square, both of N.Y., assignors to Sperry Corporation, New York, N.Y.

Filed Nov. 16, 1981, Ser. No. 321,851
Int. Cl.³ H04R *17/00*
U.S. Cl. 367—176 **12 Claims**



1. A baffle for absorbing acoustical energy comprising:

fluid containment means having a sidewall and opposed end walls for defining therein a first fluid chamber, one of said end walls comprising a first elastic diaphragm,

viscous fluid contained within said first fluid chamber,

first screen member disposed within said first fluid chamber defining a first fluid region between said first screen and said first elastic diaphragm, said first screen member having a plurality of restricted orifices therethrough which communicate with said first fluid region,

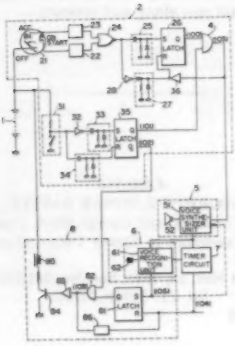
second screen member disposed within said first fluid chamber having a plurality of restricted orifices therethrough,

channel means positioned between said first and second screen members having a plurality of fluid passages for controlling flow of said viscous fluid between said orifices of said first and second screen members.

4,450,545
VOICE RESPONSIVE DOOR LOCK SYSTEM FOR A MOTOR VEHICLE

Norimasa Kishi; Kazunori Noso, and Yasuhisa Takeuchi, all of Yokosuka, Japan, assignors to Nissan Motor Co., Ltd., Yokohama City, Japan

Filed Mar. 9, 1982, Ser. No. 356,481
Claims priority, application Japan, Mar. 11, 1981, 56-33999
Int. Cl.³ E05B 49/00; B60Q 1/00
U.S. Cl. 367—198 11 Claims



1. A voice responsive door lock system for a motor vehicle having a door and a door lock device, comprising:

a status detection means for producing a standstill indication signal when the vehicle is at standstill;

a door position sensing means for producing a door open indication signal when the door is open and a door closure indication signal when the door is closed;

a gate means for producing an indication command signal upon presence of said standstill indication signal and said door open indication signal;

an indication means responsive to said indication command signal for indicating a question to an operator as to the necessity of locking the door upon receiving said indication command signal and producing a voice recognition start signal upon completion of indication of the question;

a timer means responsive to said voice recognition start signal for producing a stop command signal when a predetermined time period has elapsed after receiving said voice recognition start signal;

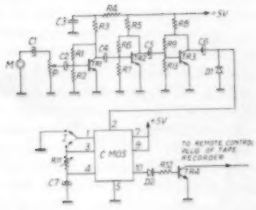
a voice recognition means responsive to said voice recognition start signal and said stop command signal for discriminating preselected words of the operator to determine whether or not the door should be locked, and for producing a door lock command signal upon determination of locking the door; and

a door lock control means responsive to said door lock command signal and said door closure indication signal for actuating the door lock device upon reception of said door lock command signal and said door closure indication signal.

4,450,546
SPEECH CONTROLLED START-STOP OF TAPE RECORDER IN RECORD AND REPRODUCE MODES BY SEPARATE MICROPHONE

Louis Kanny, rue Savier, 35, Malakoff, France 92240

PCT No. PCT/FR81/00085, 371 Date Feb. 25, 1982, 102(e) Date Feb. 25, 1982, PCT Pub. No. WO82/00217, PCT Pub. Date Jan. 21, 1982
PCT Filed Jun. 29, 1981, Ser. No. 355,755
Claims priority, application France, Jul. 1, 1980, 80 14601
Int. Cl.³ G11B 15/18
U.S. Cl. 369—24 7 Claims

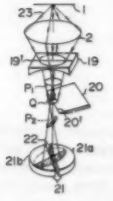


1. Electronic device permitting by the speech action to control the automatic start and stop of a tape recorder comprising a microphone for producing low frequency input signals, an input signal re-shaping circuit, a flip-flop, and an electronic switch for controlling the motor of the tape recorder, characterized in that the microphone is constituted by an additional element which is autonomous from the recording microphone, and completely independent from the tape recorder recording and playing back circuits, and in that the device further comprises a two-position switch associated with the flip-flop to authorize an automatic control of the start-stop of the tape recorder when the latter is in a playing back position or in a recording position, a first position of the switch corresponding to the playing back operation of the tape recorder and triggering the stop through speech and the start through absence of the speech, and a second position of the switch corresponding to a recording operation of the tape recorder and triggering the start through speech and the stop through absence of speech.

4,450,547
FOCAL POSITION DETECTING OPTICAL APPARATUS

Shigeru Nakamura, Hachioji; Takeshi Maeda, Kokubunji; Toshimitsu Kaku, Hachioji; Yoshito Tsunoda, Mitaka; Wasao Takasugi, Higashiyamato, and Tokuya Kaneda, Odawara, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 20, 1981, Ser. No. 313,218
Claims priority, application Japan, Dec. 26, 1980, 55-183911
Int. Cl.³ G11B 7/00
U.S. Cl. 369—45 20 Claims



1. A focal position detecting optical apparatus comprising:

a first optical system for illumination of a focused light beam onto an object to be irradiated;

a second optical system disposed in a path of a light beam

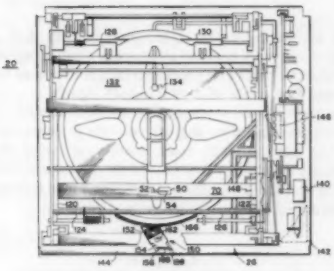
reflected from or transmitted through the object, said second optical system including first optical means having a unidirectional lens action for condensing the reflected or transmitted light beam and forming focal point images of the light beam at two foci spaced apart from each other, and second optical means disposed between the two foci for extracting a part of the light beam from the first optical means by splitting the light beam along a splitting line; and detector means disposed rearwardly of the two foci for detecting a light beam pattern formed by said second optical system, the light beam pattern being rotated in accordance with the focal position of said first optical system.

4,450,548

DISC RECORD PLAYER HAVING STYLUS CLEANER

Larry M. Hughes, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.

Filed Sep. 28, 1982, Ser. No. 426,008
Int. Cl.³ G11B *3/58*
U.S. Cl. 369—71 **8 Claims**



1. In a record player including a pickup stylus subject to engagement with a turntable-supported record for recovering prerecorded information disposed thereon during playback; said stylus being mounted at one end of a stylus arm having the other end yieldably supported in a carriage which is subject to translatory motion along a first path between an off-record rest position and playback positions over said record; said player further having means mounted in said carriage for lifting and lowering said stylus in a manner causing said stylus to protrude from said carriage to effect engagement and disengagement of said stylus with a record disposed on said turntable; stylus cleaning apparatus comprising:

(A) a cleaning element;

(B) a holder carrying said cleaning element;

(C) means for mounting said holder for motion along a second path such that said carriage engages said holder to cause displacement of said cleaning element along said second path away from the center of said turntable during translation of said carriage toward said rest position;

(D) means for causing displacement of said cleaning element along said second path toward said turntable center during translation of said carriage away from said rest position; and

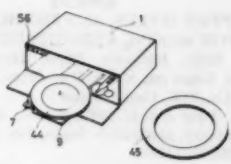
(E) means for selectively energizing said stylus lifting/lowering means to cause engagement of said stylus with said cleaning element at points beyond the periphery of a turntable-supported record to effect cleaning of said stylus during travel of said carriage between said rest position and an intermediate position between said rest position and said playback positions, and while said cleaning element is in motion along said second path.

4,450,549

COMPACT BOOKSHELF TYPE RECORD PLAYER

Yuji Ikedo; Isami Kenmotsu, and Nobuyuki Isobe, all of Saitama, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Aug. 18, 1981, Ser. No. 293,798
Claims priority, application Japan, Aug. 18, 1980, 55-112689
Int. Cl.³ G11B *1/00, 25/04*
U.S. Cl. 369—75.1 **19 Claims**



1. A compact record player comprising:

a slide base slidably movable along a receiving position in which a record cannot be played, a play position on a front side of said receiving position, and a record disc change position on a front side of said play position such that said player has a reduced effective lateral depth;

switch means for producing an electrical control signal, and means for moving said slide base in response to said control signal;

a rack member movable back and forth on said slide base;

rack member drive means for driving said rack member; and

locking means movably mounted on said slide base;

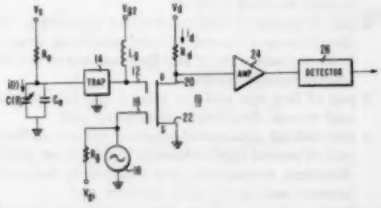
wherein said locking means can be selectively engaged with said rack member to thereby control a movement of said slide base.

4,450,550

PICKUP CIRCUIT FOR VIDEO DISC INCLUDING DUAL-GATE FET WITH INJECTED RF

Fred Sterzer, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Sep. 30, 1981, Ser. No. 307,023
Int. Cl.³ G11B *9/06*
U.S. Cl. 369—126 **8 Claims**



1. In a video disc playback system for use in recovering an information signal recorded in a first given frequency band along an information track on a surface of a record disc, said information being recorded as variations in the geometry of said information track, an apparatus comprising:

a stylus having a conductive electrode, said stylus being adapted to track said information track, said conductive electrode sensing signals which vary in accordance with variations in the capacitance between said electrode and a conductive property of said information track said capacitance variations corresponding to variations in the geometry of said information track;

a dual-gate field-effect transistor having a first gate of said

dual-gate transistor coupled to said conductive electrode; and

a source of radio frequency signals coupled to a second gate of said dual-gate transistor;

said dual-gate field-effect transistor detecting said variations in capacitance and mixing said detected variations in capacitance with said radio frequency signals from said source to provide an output signal of a second given frequency band.

4,450,551

KEEL-TIPPED STYLUS, AND METHOD AND DEVICE FOR MAKING KEEL-TIPPED STYLUS

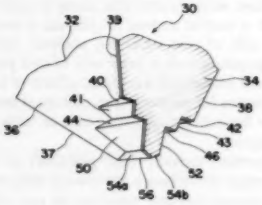
Toshiyuki Kudo, Hirakata; Kazuo Itoh, Matsubara, and Masafumi Kitamura, Nara, all of Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan

Filed Jun. 15, 1982, Ser. No. 388,634

Claims priority, application Japan, Jun. 19, 1981, 56-95494; Sep. 14, 1981, 56-145166

Int. Cl.³ G11B *9/06, 3/00*

U.S. Cl. 369—173 **8 Claims**



1. A keel-tipped stylus for reading prerecorded information on a disc record groove, said keel-tipped stylus comprising:

a body made of electrically non-conductive, hard and brittle material, said body comprising:

first and second surfaces bevelled with each other and intersecting at a prow line;

a front surface extending between said first and second bevelled surfaces with a predetermined acute angle contained between said prow line and said front surface, said front surface being tapered;

a pair of first shoulders extending, respectively, from opposite sides of said front surface to said first and second bevelled surfaces;

a pair of second shoulders provided adjacent to said first shoulders on a tapered side and extending, respectively, from opposite sides of said front surface to said first and second bevelled surfaces;

a pair of first side surfaces joining said first shoulders to said second shoulders, respectively; and

a fore-and-aft constricted terminal portion defined by a pair of second side surfaces extending from said second shoulders, respectively, and a bottom surface extending between said second side surfaces; and

an electric conductive film, deposited on said front face of the body.

4,450,552

LINEAR VELOCITY CONTROL MEANS

Angelo R. Marcantonio, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Mar. 31, 1982, Ser. No. 363,809

Int. Cl.³ G11B *19/24*

U.S. Cl. 369—240 **4 Claims**

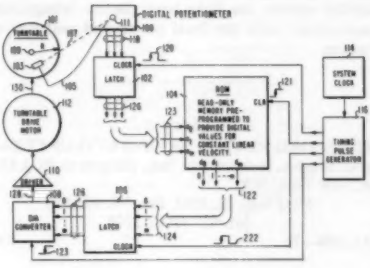
1. A velocity control for a rotating disc comprising:

a digital potentiometer controllable by an arm rotatable about a fixed axis to produce a first series of digital output signals whose values are proportional to the simultaneous angular displacement of said arm;

a rotating disc with a spiralling track thereon;

a stylus secured to said arm;

said arm, said disc, and said stylus being relatively positioned so that said stylus will follow said track across said disc in an arcuate path whose radius is equal to the distance between said fixed axis and the point of projection of said stylus upon said disc so that the angular movement of said arm is a measure of the position of said stylus along said arcuate path;



signal generating means responsive to said first series of digital output signals to produce a control signal whose amplitude varies as a predetermined function of the values of said first series of digital output signals;

prime mover means responsive to said control signal to rotate said disc at an angular velocity to cause the portion of the track directly underneath said stylus to have a velocity which is a function of the position of said stylus along said arcuate path, said last-mentioned function being determined by said predetermined function.

4,450,553

MULTILAYER INFORMATION DISC

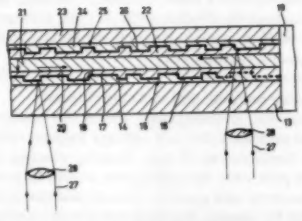
Peter L. Holster, and Johannes M. Wittkämper, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 26, 1979, Ser. No. 6,609

Claims priority, application Netherlands, Mar. 22, 1978, 7803069

Int. Cl.³ G11B *7/24*

U.S. Cl. 369—275 **13 Claims**



1. A multilayered record containing information in optically readable form, said record comprising a planar member of a material substantially transparent to radiation with which the information is to be read, an optical structure extending over at least a portion of each of two opposite surfaces of said planar member, said optical structures each having a plurality of planar information areas arranged in an information track and disposed in a first plane generally parallel to the plane of said planar member, said information areas being spaced from each other in the track direction by regions spaced from said first plane in a direction perpendicular thereto and being adapted to

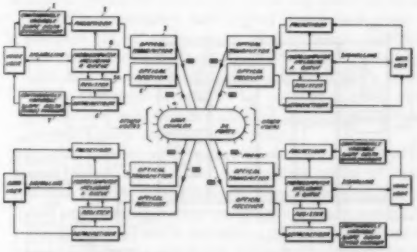
be read by a beam of radiation from a source positioned on one side of said planar member, and a first and second reflective layer covering the entire optical structure on said one side of said planar member and the entire optical structure on the other side of said planar member, respectively, at least said first reflective layer being partially transmissive to said radiation whereby the optical structure on said other side is read by radiation which passes through said first reflective layer and is incident onto said optical structure on said other side, the information recorded on said optical structure on said other side being derived from the portion of the radiation reflected by said second reflective layer.

4,450,554

ASYNCHRONOUS INTEGRATED VOICE AND DATA COMMUNICATION SYSTEM

Peter D. Steensma, Midland Park; Murray Weinberg, Union; Robert W. Smid, Wykoff, and Thomas E. Finley, Pompton Lakes, all of N.J., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Aug. 10, 1981, Ser. No. 291,690
Int. Cl.³ H04J 3/16
U.S. Cl. 370—4 **33 Claims**



1. An asynchronous integrated voice and data communication system comprising:

a plurality of data users;

a plurality of voice users;

a fiber optic transmission medium enabling each of said plurality of data and voice users to receive packet type transmissions from all others of said plurality of data and voice users at any completely random time;

a plurality of first means each coupled to a different one of said plurality of voice users to convert voice signals to coded signals and vice versa;

a plurality of second means each coupled to said transmission medium, certain ones of said plurality of second means each being coupled to certain ones of said plurality of second means each being coupled to a different one of said plurality of first means and other ones of said plurality of second means each being coupled to a different one of said plurality of data users to enable each of said plurality of data and voice users to have completely random pocket type access to said transmission medium at any time; and

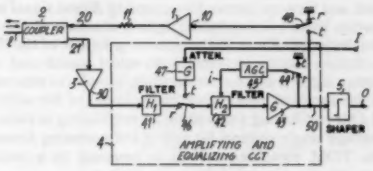
a plurality of third means each coupled to a different one of said second means and an associated one of said plurality of data and voice users to enable any one of said plurality of data and voice users to establish communication with any other selected one of said plurality of data and voice users at any completely random time.

4,450,555

DEVICE FOR MINIMIZING FAR-END CROSSTALK BETWEEN HALF-DUPLEX DIGITAL TRANSMISSION LINES

Gérard J. P. Pays, Chemin de Toul-ar-laan, Perros-Guirec, France (22700)

Filed Oct. 7, 1981, Ser. No. 309,512
Claims priority, application France, Oct. 8, 1980, 80 21483
Int. Cl.³ H04B 1/44
U.S. Cl. 370—31 **11 Claims**



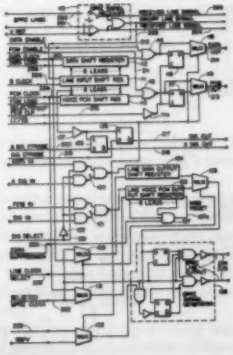
1. Device for minimizing far-end crosstalk between digital transmission lines, said device being included in a half-duplex digital transmission station linked to one end of a section of one of said lines, said one line section having another end that is a grouping point for said lines, and an attenuation less than a pre-determined maximum attenuation of a section of one of the lines having the greatest attenuation between a half-duplex digital transmission station and said grouping point, said device comprising equalizing means included in a receiving channel of said station linked to said one end, said equalizing means including a filter having a transfer gain substantially equal to the difference between the attenuation of said line section connected to said one end and said maximum attenuation, and switching means for connecting said filter in series into a transmitting channel of said station during each transmission operation of the half-duplex cycle of said station.

4,450,556

DIGITAL SIGNAL SUBSCRIBER LOOP AND INTERFACE CIRCUIT

Alberto Boleda, Menlo Park, Calif., and Terence N. Thomas, Ontario, Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Oct. 17, 1980, Ser. No. 197,939
Int. Cl.³ H04J 3/00
U.S. Cl. 370—58 **5 Claims**



1. A telephone system having a time division multiplex (TDM) facility with subscriber ports, for connection with remote telephone user terminals via associated single channel codecs, each single channel codec being for receiving analog

signals from an associated one of the telephone user terminals, for coupling corresponding digital signals in an operating signal format of the TDM facility to an associated subscriber port, for accepting digital signals in the operating signal format of the TDM facility from the associated subscriber port, and for transmitting corresponding analog signals to the user telephone terminal the telephone system being characterized by:

digital signal transmit and receive paths terminated at line interface units, the line interface units being for interfacing digital signals in an operating format of the transmit and receive paths with the operating format of the codec and the TDM facility, each line interface unit including;

a store and forward circuit for accepting digital signal information bytes corresponding to two channels of information bytes per frame in the operating format of the TDM switching facility in response to select signals and input timing signals, and for transmitting signals corresponding to the accepted information bytes via one of the paths and at a bit rate having a maximum corresponding to twice the average single channel bit rate in the operating format of the TDM switching system in response to a periodic transmission timing signal;

an accumulate and forward circuit for accepting and accumulating information bytes bit by bit from one of the transmit and receive paths in response to a periodic acceptance timing signal, and for outputting accumulated information bytes in the operating format of the TDM facility in response to output timing signals;

timing circuitry, being alternately programmable;

(a) to be responsive to select signals and periodic system timing signals from the TDM facility for generating the input timing signals, the periodic transmission timing signal and the output timing signals, and to be responsive to signal transitions in signals from the transmit path for generating the periodic acceptance timing signal, or

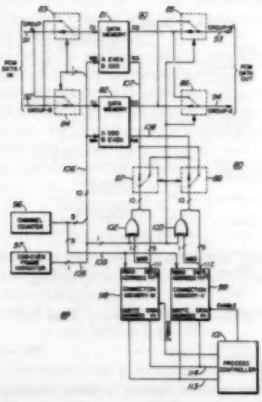
(b) to be responsive to signal transitions in signals from the receive path and periodic timing signals from a local clock source for generating the select signal, the input timing signal, the periodic transmission timing signal. the output timing signal and the periodic acceptance timing signal.

4,450,557

SWITCHING NETWORK FOR USE IN A TIME DIVISION MULTIPLEX SYSTEM

Ernst A. Munter, Kanata, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Nov. 9, 1981, Ser. No. 319,198
Int. Cl.³ H04J *3/08*
U.S. Cl. 370—58 **31 Claims**



8. A switching network for use in a TDM (time division multiplex) system for switching digital signals carried in timeslots on P pairs of incoming buses to timeslots on P pairs of outgoing buses, wherein P is a positive integer, P≧1, said network comprising:

P pairs of memory means, each said pair of memory means responsive to a pair of incoming buses, in a one to one relationship, each said memory means comprising P storage means; and

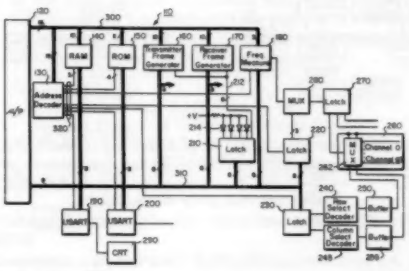
each pair of outgoing buses being responsive to a distinct group of 2P storage means, each said group of storage means comprising one storage means from each of said memory means.

4,450,558

METHOD AND APPARATUS FOR ESTABLISHING FRAME SYNCHRONIZATION

Dean A. Hampton, Watertown; Christian C. Jacobsen, Brookfield, and Gary A. Profet, Watertown, all of Conn., assignors to General Datacomm Industries, Inc., Danbury, Conn.

Filed Jan. 12, 1981, Ser. No. 224,338
Int. Cl.³ H04J *3/06*
U.S. Cl. 370—106 **19 Claims**



1. In a time division multiplexer for multiplexing data and control signals from a plurality of individual data channels so as to produce a single stream of signals on an aggregate transmission line, said multiplexer including a frame generator which generates select signals that are used to select for transmission either data from individual data channels or overhead signals including synchronization signals, a method of synchronizing a local and a remote station by transmission of frame synchronization signals comprising the steps of:

generating a first frame which provides for the transmission of a frame synchronization pattern at least twice and contains no customer-generated signals that are as long as said frame synchronization pattern,

transmitting signals from said local station to said remote station in accordance with said first frame until frame synchronization is established,

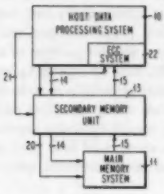
generating a second frame of longer duration than the first frame which provides for the transmission of a preponderance of data signals and at least one frame synchronization signal, and

transmitting signals from said local station to said remote station in accordance with said second frame after frame synchronization is established.

4,450,559
MEMORY SYSTEM WITH SELECTIVE ASSIGNMENT OF SPARE LOCATIONS

George L. Bond, Fishkill, and Akella V. S. Satya, Wappingers Falls, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 24, 1981, Ser. No. 334,343
Int. Cl.³ G06F *11/20*; G11C *29/00*
U.S. Cl. 371—10 11 Claims



1. In a data processing system having a central processing unit including a memory input bus and a memory output bus each having K lines for transferring a data word consisting of K bit positions between the CPU and a main memory which comprises a large plurality of memory locations each of which includes K failure independent bit cells with each said location being individually addressable through a memory address bus, and an error correcting system for correcting predetermined types of errors in data words transferred from said main memory, the improvement comprising:

a control system for selectively replacing defective bit cells in said main memory, said control system including:

a plurality (N) of replacement sections, each of which is associated with a different group of (K/N) bit positions of said data word, each said section comprising a separate failure independent memory for each bit position of said group, each said memory element comprising a plurality of individually addressable bit cells;

means for partially addressing said memory element of each said replacement section with a first subset of address signals directly from said main memory address bus, each said replacement section being further characterized by a writable index which includes a plurality of control data storage locations which are individually addressable by a second subset of address signals from said main memory address bus to provide at least a third subset of address signals which when combined with said first subset of address signals comprise the complete address for said memory element, and means for developing control signals for each said writable index based on the distribution of defective bit cells in each data word storage location of said main memory.

4,450,560
TESTER FOR LSI DEVICES AND MEMORY DEVICES

George W. Conner, Newbury Park, Calif., assignor to Teradyne, Inc., Boston, Mass.

Filed Oct. 9, 1981, Ser. No. 309,981
Int. Cl.³ G01R *31/28*
U.S. Cl. 371—25 11 Claims

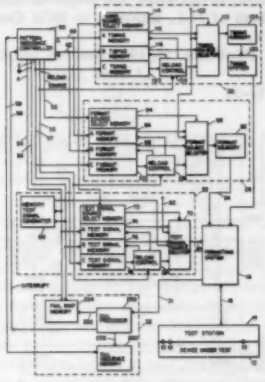
1. Apparatus for testing LSI and memory devices by injecting test signals and comparing resulting output signals with standards, said devices each having a multiplicity of pins, said pins of said memory devices comprising address pins and data pins, said apparatus comprising:

a sequence controller for sequencing the injections of said test signals and the comparisons of said resulting output signals with said standards,

a storage element for storing said test signals and said standards for said LSI devices,

a generator for generating said test signals and said standards for said memory devices,

source switching circuitry responsive to said sequence controller, said source switching circuitry being connected to selectably route said test signals and said standards for said



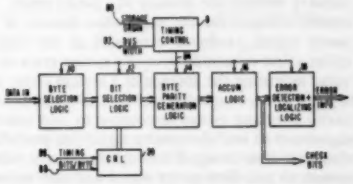
LSI devices from said storage element to said pins, or said test signals and said standards for said memory devices from said generator to said data pins, and

a comparator for comparing said resulting output signals with said standards.

4,450,561
METHOD AND DEVICE FOR GENERATING CHECK BITS PROTECTING A DATA WORD

Volkmar Götze, Grafenau, and Günther Potz, Sindelfingen, both of Fed. Rep. of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 16, 1982, Ser. No. 358,737
Claims priority, application Fed. Rep. of Germany, Jun. 5, 1981, 3122381
Int. Cl.³ G06F *11/10*
U.S. Cl. 371—37 12 Claims



1. Generalized apparatus for generating check bits of an error correction code (ECC) protecting a data word comprising:

means for dividing the data word into successive data bytes,

N logic means each for combining in parallel any combination of the N bits in each successive byte to generate a partial sum of all ECC check bits for each successive byte,

N program controlled gating means for selecting different combinations of bits out of the full data bytes to the N logic means,

means for storing data for programming said N programmable gating means to each possible different combinations of bits for successive data bytes of the N logic means in accordance with the H matrix of the ECC code,

means for modulo 2 summing all partial sums of each check bit to generate the check bit whereby the same apparatus

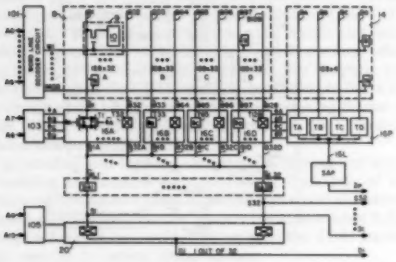
may be used to generate check bits for a number of different combinations of data word lengths and ECC codes.

4,450,562

TWO LEVEL PARITY ERROR CORRECTION SYSTEM

Ihor T. Wacyk, Bridgewater, and Roger G. Stewart, Neshanic Station, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Mar. 26, 1982, Ser. No. 362,465
Int. Cl.³ G06F *11/10*
U.S. Cl. 371—51 **10 Claims**



1. An integrated circuit (chip) suitable for use in a memory system comprising:

a random access memory (RAM) array having R·C bit locations arranged in R rows and C colums, said RAM being organized into W "internal" words of L bits each; where W·L is equal to R·C and where R, C, W and L are digits greater than 1;

a parity array section of W bits for storing a parity bit for each one of said W "internal" words;

decoding means coupled to said RAM for selectively reading one of said "internal" words and for selectively reading-out a particular data bit (D) out of the L bits of said selected one of said "internal" words;

parity checking means responsive to the parity of the L bits of a selected internal word and to its associated parity bit for producing a first parity signal having a first value to indicate the presence of a parity error and having a second value to indicate the absence of a parity error;

a control terminal for the application thereto of a system parity signal, produced externally to the chip, having either a first value indicative of a system error or a second value indicating the absence of a system error; and

first logic means coupled to said control terminal and to said parity checking means responsive to said system parity signal and to said first parity signal for producing at its output a control signal having one binary value in response to said first parity signal and said system parity signal indicating the presence of errors and having the other binary value when only one or none of said first parity and system parity signals indicate the presence of an error.

4,450,563

RAPIDLY TURNABLE LASER SYSTEM

Stephen J. Bepko, Catonsville, Md., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 23, 1982, Ser. No. 371,100
Int. Cl.³ H01S *3/10*
U.S. Cl. 372—23 **8 Claims**

1. A laser system rapidly tunable between at least two preselected laser wavelengths comprising:

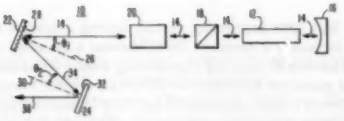
a lasing cell having two ends and operative to emit a coherent beam of radiation therefrom along an optical path;

a mirror optically separated from one end of the lasing cell along the optical path for reflecting said radiation beam back along the optical path to said lasing cell;

means operative to rapidly modulate the emitted radiation beam between at least two polarization states;

a first reflecting means optically separated from the other end of said lasing cell along the optical axis and fixedly aligned to have a first predetermined incident angle with said polarized radiation beam, said first reflecting means being operative in response to incident radiation in one polarization state to retroreflect a first portion of said radiation beam at substantially one wavelength which is unique to said first predetermined incident angle and to specularly reflect a second portion of said radiation beam along a first path, and operative in response to incident radiation in another polarization state to specularly reflect said radiation beam along said first path; and

a second reflecting means optically separated from said first reflecting means along said first path and fixedly aligned to have a second predetermined incident angle with the



radiation beam reflected along said first path, said second reflecting means being operative in response to incident radiation in said other polarization state to retroreflect a third portion of said radiation beam at substantially another wavelength which is unique to said second predetermined incident angle and to specularly reflect a fourth portion of said radiation beam along a second path, and operative in response to incident radiation in said one polarization state to specularly reflect a fifth portion of said radiation beam along said second path, said rgtroreflected first and third portions of said radiation beam being sufficient to cause resonance at said one and another wavelengths, respectively, whereby when said emitted radiation beam is modulated in said one polarization state the laser system is tuned to said one wavelength and when said emitted radiation beam is modulated in said other polarization state the laser system is tuned to said other wavelength and whereby said modulating means is operative to rapidly modulate therebetween.

4,450,564

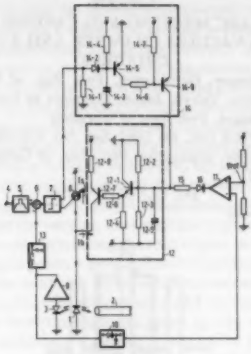
APPARATUS FOR MODULATING THE OUTPUT SIGNAL OF A CONVERTER

Lambertus J. Meuleman; Abram van de Grijp, and Engel Roza, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 4, 1981, Ser. No. 299,436
Claims priority, application Netherlands, Sep. 15, 1980, 8005153
Int. Cl.³ H01S *3/10*
U.S. Cl. 372—26 **11 Claims**

1. An arrangement for modulating the output signal of an electric signal converter comprising: an analog signal input terminal, a subtraction device having first and second inputs and an output, a signal limiter coupled to the output of the subtraction device for producing a pulse-shaped output signal for controlling the signal converter, a signal demodulator, means coupling the first input of the subtraction device to said input terminal, and means connecting the subtraction device, the limiter, the signal converter and the demodulator in a feedback loop wherein the demodulator demodulates a portion of the converter output signal to supply a feedback signal to the second input of the subtraction device whereby the feedback signal is subtracted from the analog input signal, an out-

put signal of the subtraction device controlling the limiter which produces said pulse-shaped output signal for controlling the converter, whereby a self-excited oscillation is produced in



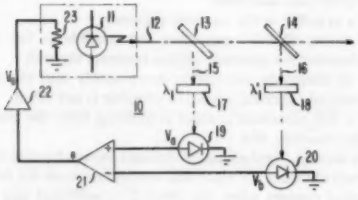
the feedback loop with an analog signal dependent modulation of the pulse width and/or pulse density of the limiter output signal.

4,450,565

SPECTRALLY STABILIZED LASER

John A. Copeland, Fair Haven, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Aug. 23, 1982, Ser. No. 410,260
Int. Cl.³ H01S *3/19*
U.S. Cl. 372—32 **6 Claims**



1. In combination:
a semiconductor laser having a preferred operating mode;
means for measuring the output powers in a pair of side modes of said laser located adjacent to said preferred mode;
means for comparing said output powers and forming an error signal;
and means, responsive to said error signal, for controlling the operating temperature of said laser.

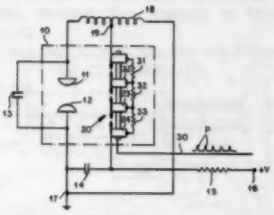
4,450,566

PRE-IONIZING TRIGGER SYSTEM FOR A GAS LASER

Renato Marchetti; Eugenio Penco, and Ugo Perito, all of Rome, Italy, assignors to Selenia, Industrie Elettroniche Associate, S.p.A., Rome, Italy

Filed Feb. 17, 1982, Ser. No. 349,513
Claims priority, application Italy, Feb. 20, 1981, 47851 A/81
Int. Cl.³ H01S *3/097*
U.S. Cl. 372—38 **5 Claims**

1. In a laser having a gas-filled cavity, a pair of spaced-apart excitation electrodes in said cavity, a pumping capacitor continuously charged by a source of electrical energy with a grounded terminal and a high-voltage terminal, and a discharge circuit including a trigger switch connecting said pumping capacitor across said excitation electrodes, the improvement wherein one of said excitation electrodes is directly connected to ground and said trigger switch comprises a nonconductive support in said cavity provided with a plurality of spaced-apart metallic bodies forming a condenser chain between the other of said excitation electrodes and said high-voltage terminal, said bodies having pointed extensions confronting each other across intervening gaps, and a conductor



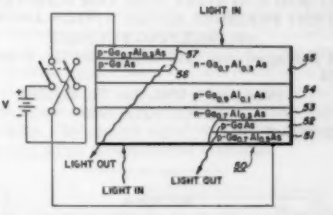
juxtaposed with said support in the vicinity of one of said gaps and connected to a generator of recurrent control pulses for periodically modifying the electric field set up across said condenser chain by the charge of said pumping capacitor to initiate spark discharges between said confronting extensions for establishing a conductive path across said gaps, thereby closing said discharge circuit.

4,450,567

OPTICAL REPEATER INTEGRATED LASERS

Donald R. Scifres, Los Altos; William Streifer, Palo Alto, and Robert D. Burnham, Los Altos Hills, all of Calif., assignors to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 056,765, Jul. 12, 1979, Pat. No. 4,316,156.
This application Jan. 4, 1982, Ser. No. 336,750
Int. Cl.³ H01S *3/19*
U.S. Cl. 372—50 **9 Claims**



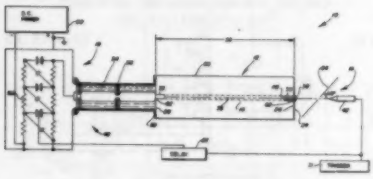
1. A bilateral switch comprising a plural layer semiconductor diode laser which is electrically biased to the point wherein light input causes the laser to commence lasing from an active semiconductor layer, such that the improvement is characterized by:
a first plural layer diode laser switch of intermixed layers of n and p type semiconductor material, the junction of two of said intermixed layers being forward biased at the application of the electrical bias of one polarity such that laser light is emitted from a first active semiconductor layer,
a second plural layer diode laser switch on the same crystalline structure as said first laser switch of intermixed layers of n and p type semiconductor material, the junction of two different intermixed layers being reverse biased at the application of said electrical bias of one polarity,
wherein said first laser switch is reverse biased at the application of an electrical bias of a second polarity and said second laser switch is forward biased at the application of said electrical bias of a second polarity, such that laser light is emitted from a second active semiconductor layer.

4,450,568

PUMPING A PHOTOLYTIC LASER UTILIZING A PLASMA PINCH

John F. Asmus, La Jolla, Calif., assignor to Maxwell Laboratories, Inc., San Diego, Calif.

Filed Nov. 13, 1981, Ser. No. 321,118
Int. Cl.³ H01S *3/09*
U.S. Cl. 372—76 **21 Claims**



1. In a photolytic gas laser with a resonator chamber confining a gas that upon ionization in a plasma radiates in the vacuum ultraviolet, said gas including a laser medium, said laser medium being photodissociable by vacuum ultraviolet radiation to produce particles having an upper laser state whence they undergo spontaneous transition to a lower laser state by laser action, pumping apparatus comprising:

a pair of spaced electrodes within said chamber;

preconditioning means for preferentially exciting gas particles along an elongated channel within the chamber and between said electrodes;

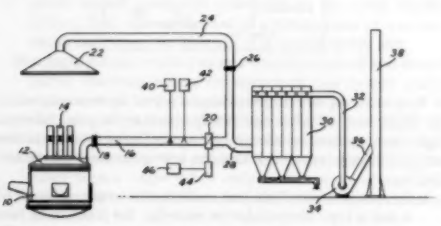
discharge means for passing electric current between said electrodes to form from preferentially excited gas particles within said channel a plasma pinch in the gas that radiates in the vacuum ultraviolet without substantial expansion of the plasma into the surrounding gas during such radiation.

4,450,569

METHOD AND STRUCTURE FOR MAINTAINING EFFLUENT PRESSURE RANGE WITHIN AN ELECTRIC ARC MELTING FURNACE

Willem J. Hagendoorn, 1219 Constitution Dr., Louisville, Ky. 40214

Filed Sep. 1, 1982, Ser. No. 413,718
Int. Cl.³ F27D *7/00*
U.S. Cl. 373—9 **7 Claims**



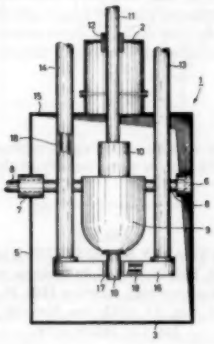
3. A metal melting furnace installation having an off-gas duct structure for conducting gaseous effluent away from the furnace, a draft-regulating means within the duct for selectively varying the rate of effluent flow through the duct, sensors on the duct structure for constantly monitoring variable physical characteristics of the effluent flow within the duct, and program-reactive control means operatively connected to the draft-regulating means and adapted to electronically interpret and process data transmitted from the sensors pursuant to a pre-established program utilizing correlations between furnace internal and off-gas duct structure physical characteristics and thereby automatically operate the draft regulating means to maintain static pressure in the furnace within a preferred range.

4,450,570

VACUUM ARC MELTING AND CASTING FURNACE WITH A VACUUM CHAMBER AND A TILTING CRUCIBLE

Ernst Weingärtner, Gelnhausen, Fed. Rep. of Germany, and Klaus Samietz, Tokyo, Japan, assignors to Leybold-Heraeus GmbH, Cologne, Fed. Rep. of Germany

Filed Oct. 18, 1982, Ser. No. 435,130
Claims priority, application Fed. Rep. of Germany, Oct. 17, 1981, 3141312
Int. Cl.³ F27D *11/08*
U.S. Cl. 373—69 **10 Claims**



5. A vacuum arc melting and casting furnace, comprising:

(a) a vacuum chamber;

(b) a crucible in the vacuum chamber;

(c) means tiltably supporting the crucible in the vacuum chamber for pouring out the contents thereof;

(d) an electrode extendable downwardly into the crucible coaxially thereof when the crucible is not tilted;

(e) a first electrical contact projecting from the bottom of the crucible; and

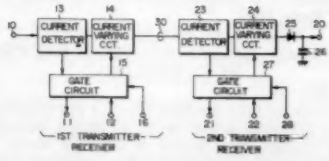
(f) a second, rigid electrical contact means fixed in the vacuum chamber for electrical connection with the first electrical contact when the crucible is not tilted and separation therefrom when the crucible is tilted.

4,450,571

TWO-WAY SIGNAL TRANSMISSION AND ONE-WAY DC POWER SUPPLY USING A SINGLE LINE PAIR

Takashi Hirayama, Tachikawa, and Yuichi Igarashi, Sukagawa, both of Japan, assignors to Iwasaki Tsushinki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 22, 1981, Ser. No. 256,598
Claims priority, application Japan, Apr. 22, 1980, 55-52316
Int. Cl.³ H04L *5/14*
U.S. Cl. 375—7 **2 Claims**



1. A pulse signal transmission system for performing two-

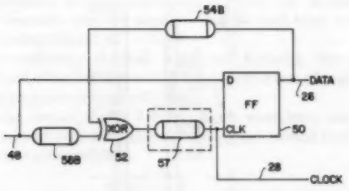
way signal transmission between a first transmitter-receiver and a second transmitter-receiver interconnected via a pair of signal lines and supplies a DC current from the first transmitter-receiver to the second one through said pair of signal lines, characterized in that the first transmitter-receiver comprises a first current varying a signal line current in response to a first transmission pulse signal and means effective for varying the signal line current so that the signal line current has a value in a predetermined current region lower than a minimum level of a load current to the second transmitter-receiver during transmission of a signal pulse from the first transmitter-receiver; the second transmitter-receiver having a second detector for detecting a current or voltage variation in the signal line current, a second current varying circuit for varying the signal line current in response to a second transmission pulse signal and means effective for varying the signal line current so that it has a value in the predetermined current region during transmission of the signal pulse, a gate circuit for blocking the detected output from the second detector while the second transmission pulse signal is transmitted by the second current varying circuit; and the first transmitter-receiver having a first current detector for detecting a current variation in the signal line current in response to the second transmission pulse, and another gate circuit for blocking the detected output from the first current detector while the first transmission pulse signal is transmitted.

4,450,572

INTERFACE FOR SERIAL DATA COMMUNICATIONS LINK

Robert E. Stewart, Stow, Mass.; John E. Buzynski, Windham, and Robert Giggi, Merrimack, both of N.H., assignors to Digital Equipment Corporation, Maynard, Mass.

Filed May 7, 1982, Ser. No. 376,069
Int. Cl.³ H03K *5/13*
U.S. Cl. 375—87 **11 Claims**



1. An interface for connecting a device (**12***c*) to a communications link (**14, 15, 16**) having at least one serial data channel over which information signals comprising combined clocking and data signals are transmitted and wherein said data signals include at least one synchronizing character, said interface comprising:

A. decoder means (**22**) for separating the clocking and data signals,

B. serial register means (**30**) for serially receiving the data signals under control of the clocking signals, and

C. said decoder means comprising

i. a flip-flop (**50**) having a data input for receiving the information signals,

ii. an exclusive-OR gate (**52**) which receives at one input thereof the data output of the flip-flop, said exclusive-OR gate being coupled for clocking the clocking input of the flip-flop,

iii. a delay means (**58A** or **58B**) having an output coupled to a second input of said exclusive-OR gate and an input for receiving the information signals, and

iv. the propagation delay through the flip-flop and the exclusive-OR gate being sufficient to provide at the clocking input of the flip-flop a clocking pulse of sufficient duration to satisfy the clock pulse width requirements of the flip-flop,

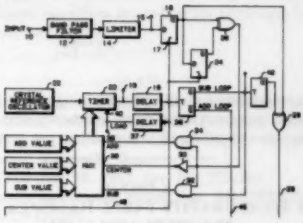
thereby to generate decoded clocking signals at the output of the exclusive-OR gate and decoded data signals at the non-inverting output of the flip-flop.

4,450,573

BIT DATA OPERATED SQUELCH

Scott W. Noble, Bedford, Tex., assignor to Motorola Inc., Schaumburg, Ill.

Filed Dec. 7, 1981, Ser. No. 328,359
Int. Cl.³ H04B *1/10*
U.S. Cl. 375—104 **10 Claims**



1. A digital bit data operated squelch circuit for a demodulator detector which provides demodulated baseband samples of bits of a digital signal synchronized with the bit edge, and clock pulses synchronized to the bit edge, said data operated squelch circuit comprising:

synchronization register means for storing the synchronized demodulated baseband samples, including at least one sample from the adjacent bit in response to a clock pulse;

logic means, coupled to the synchronization register, for generating a transition signal in response to a difference between the edge bit sample and the adjacent bit sample, and for generating a control signal in response to non-equality of at least two additional non-edge samples;

counter means, coupled to the logic means, for accumulating a count by incrementing in response to a clock pulse when the transition signal occurs, and decrementing in response to a clock pulse when a control signal occurs; and

first comparator means, coupled to the counter means, for generating a bit squelch signal in response to the counts exceeding a first predetermined threshold.

4,450,574

CONTROL CIRCUIT FOR LIQUID CHROMATOGRAPH

Arnold Schwartz, Bridgeport, Conn., assignor to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Jan. 29, 1982, Ser. No. 343,805
Int. Cl.³ G06F *15/46*
U.S. Cl. 377—2 **24 Claims**

1. A circuit for producing a plurality of control signals comprising:

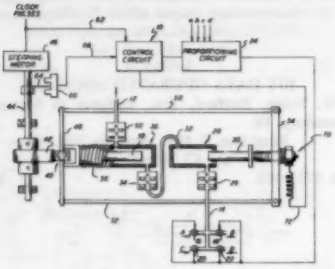
means for producing a selected number of pulses during a given time period;

a plurality of counters each settable to a given value prior to the start of said time period, the sum of the values set into said counters being less than or equal in number of said selectable number of pulses;

means to selectively apply said pulses to one of said counters at a time to cause that counter to count down to zero and thereafter apply pulses to another said counter causing it to count down, said selective pulse applying means being operative to count all said counters to zero during said given period in a prescribed sequence;

means responsive to all but one of said counters as each said counter is counted down to produce a unique control

signal indicative of a particular one of said counters being counted down; and



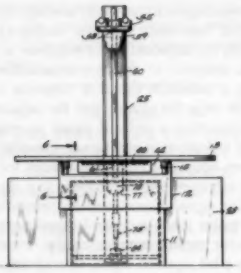
means responsive to said one remaining counter to produce another unique control signal whenever said one counter is not zero or when all said counters are zero.

4,450,575

X-RAY TOMOGRAPHY TABLE HAVING A VIRTUAL FULCRUM ARM PIVOT

Robert J. Mueller, Brookfield, Wis., assignor to General Electric Company, Schenectady, N.Y.

Filed Jan. 17, 1983, Ser. No. 458,608
Int. Cl.³ A61B *6/02*
U.S. Cl. 378—26 **9 Claims**



1. Diagnostic x-ray table apparatus comprising means for performing tomography and other x-ray procedures and having a base, an x-ray transmissive table top supported from the base, a column extending above and below the table top and mounted for moving longitudinally of the table top, means for moving the column, carriage means for an image receptor having an imaging plane, said carriage means mounted below the table top for moving longitudinally of said top, x-ray tube means and means supporting said tube means from said column above said table top for said tube means to angulate about an axis that extends laterally of the table top and is substantially perpendicular to the plane of column movement, said means for performing tomography including:

support means under the table top and means for securing said support means at a predetermined distance from said imaging plane,

extensible and contractible link means and means for pivotally connecting said link means intermediate of its ends to said support means for enabling said link means to swing about a laterally extending pivot axis, one end of said link means being pivotally connected to one side of said pivot axis to said receptor carriage means and the other end being pivotally connected on the other side of said pivot axis to said movable column,

fulcrum arm means pivotally connected at one end to said image receptor carriage means for pivoting about a laterally extending axis coincident with said image receptor imaging plane and coupled at its other end to said x-ray tube supporting means for angulating with said x-ray tube supporting means during longitudinal movement of said column in a manner that maintains the central ray of the beam from the x-ray tube in substantial parallelism with the fulcrum arm means and directs said ray to substantially the same point on said image receptor plane during a tomographic procedure,

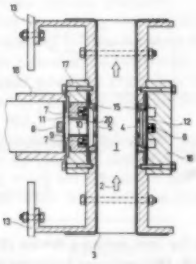
movement of said column in one direction causing said link means to swing on its support means and move said image receptor carriage in the opposite direction and causing said arm means to swing about a laterally extending virtual axis coincident with a plane of interest in a body positioned on said table top which plane of interest is at a distance from said image plane determined by the distance at which said link means pivot axis is set relative to said image plane such that an x-ray beam projected by said x-ray tube through said body will produce a tomographic image of said plane of interest on said receptor image plane.

4,450,576

APPARATUS FOR CONTINUOUSLY MEASURING THE ELEMENT CONTENT IN SLURRIES

Andrzej Lubecki, Stutensee; Kurt Wiese, Stutensee-Büchig, and Karl Winkler, Steinweiler, all of Fed. Rep. of Germany, assignors to Gesellschaft mit Kernforschungszentrum Karlsruhe beschränkter Haftung, Karlsruhe, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 141,698, Apr. 18, 1980, Pat. No. 4,388,530. This application Mar. 22, 1982, Ser. No. 360,888
Claims priority, application Fed. Rep. of Germany, Apr. 20, 1979, 2915986; Mar. 20, 1981, 3110944; Mar. 21, 1981, 3111187
Int. Cl.³ G01N *23/20*; G21K *1/00*
U.S. Cl. 378—47 **6 Claims**



1. In an apparatus for the continuous measurement by X-ray fluorescence analysis of the elemental contents of a slurry independent of the slurry density and slurry composition comprising: a measuring chamber having a slurry flow channel, a first measuring window provided at one side of the channel and a second measuring window provided at the other side of the channel, a detector disposed behind the first measuring window, a first source of primary radiation and a target disposed behind the second measuring window, the target being disposed between the second measuring window and the first source wherein the first source excites the target to emit target radiation and excites the slurry contents to emit X-ray radiation, and the primary radiation from the first source, the target radiation, and the excited X-ray are transmitted to and detected by the detector, the improvement comprising:

collimator means forming an open passage between said detector and said first measuring window, and

an annular source of primary radiation for irradiating the slurry contents to excite additional X-ray radiation therefrom located between said detector and said first measur-

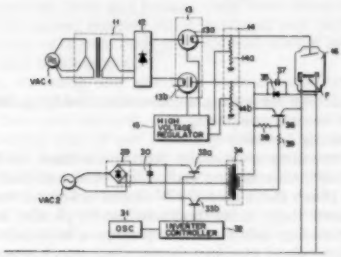
ing window and about said open passage, wherein said collimator means collimates the primary radiation, target radiation and X-ray radiation excited by said first source and said annular source of primary radiation.

4,450,577

X-RAY APPARATUS

Hideki Sato, Ootawara, and Hiroshi Asahina, Tochigi, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Sep. 14, 1982, Ser. No. 418,000
Claims priority, application Japan, Sep. 18, 1981, 56-146312
Int. Cl.³ H05G *1/30, 1/34*
U.S. Cl. 378—109 **4 Claims**



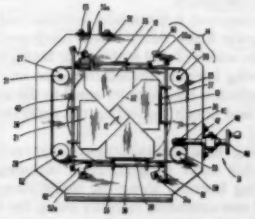
1. An X-ray apparatus comprising:
an X-ray tube;
a high voltage generating circuit for applying a high voltage between the anode and the cathode of said X-ray tube;
a direct current filament heating circuit for heating a filament of said X-ray tube;
first switching element connected between one terminal of said filament and the negative bus of said high voltage generating circuit;
second switching element connected between the other terminal of said filament and the negative bus of said high voltage generating circuit; and
switching circuit means for alternately switching said first and second switching elements at a given period to switch the tube current paths.

4,450,578

VARIABLE APERTURE COLLIMATOR FOR HIGH ENERGY RADIATION

Ronald A. Hill, Albuquerque, N. Mex., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Mar. 3, 1982, Ser. No. 354,552
Int. Cl.³ G21F *5/04*
U.S. Cl. 378—152 **10 Claims**



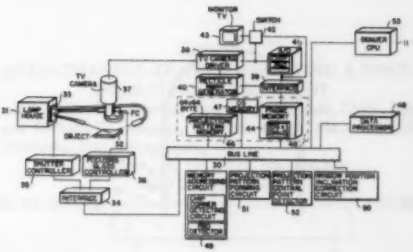
1. A variable aperture energy beam collimator apparatus comprising:
a frame member having a central aperture therethrough;
a block assembly which includes a plurality of beam-opaque blocks and variable aperture adjustment means, said adjustment means comprising guide means carried by the frame member and including an individual guide member for slidably carrying each block, each said block having interfacing edges in sliding contact with adjacent blocks and forming a completely beam-opaque surface when in a closed position; and
a first operator member carried by the frame member and first linkage means operably connected between the first operator member and the block assembly for simultaneously sliding all of the blocks along their respective guide members with respect to each other while maintaining the sliding interfaces in contact for providing an aperture of desired size.

4,450,579

RECOGNITION METHOD AND APPARATUS

Masato Nakashima, Yokohama; Tetsuo Koezuka, Tokyo, and Takefumi Inagaki, Kawasaki, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Jun. 10, 1981, Ser. No. 272,368
Claims priority, application Japan, Jun. 10, 1980, 55-78235; Dec. 29, 1980, 55-187258
Int. Cl.³ G06K *9/32*
U.S. Cl. 382—8 **23 Claims**



1. A method for recognizing a position of an object having an absolute position and orientation and having a surface and a pattern thereon, and for recognizing a desired portion of the pattern, said method comprising the steps of:
(a) sensing an image within a predetermined area of the object and forming a first and a second resolution image signal corresponding to the object and pattern respectively;
(b) detecting the position of the object in accordance with the first resolution image signal;
(c) receiving data representing a positional relation between the object and the pattern;
(d) determining a predetermined area of the object in accordance with the data representing the positional relation between the object and the pattern;
(e) detecting the position of the desired portion of the pattern in accordance with the second resolution image signal within the predetermined area, wherein the first resolution is lower than the second resolution.

4,450,580

ONE-PIECE SHOPPING BAG HANDLES

Alexander Lindsay, New York, N.Y., assignor to Modern Arts Packaging, Inc., New York, N.Y.

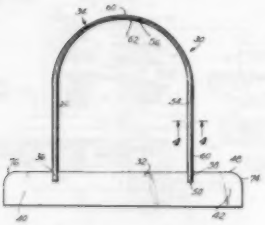
Filed Mar. 11, 1982, Ser. No. 357,307
Int. Cl.³ B65D *33/06*
U.S. Cl. 383—6 **4 Claims**

1. A shopping bag, comprising:
a container having an upper openable end, a lower closed

end, and side walls located between the ends and circumferentially bounding an interior space in which objects may be received, said side walls having upper marginal portions bounding the upper end, said container having an inner hem folded inwardly along a fold line and juxtaposed with the upper marginal portions, and openings formed along the fold line at opposite sides of the container;

a pair of one-piece handles mounted at the opposite sides of the container, each handle including a substantially planar elongated base located between a respective upper marginal portion at a respective side of the container and its respectively juxtaposed hem, each base having a first major adhesive contact surface facing and spaced from its respectively juxtaposed hem, and a second major adhesive contact surface facing and spaced from its respectively juxtaposed upper marginal portion, each handle having a predetermined thickness and being constituted of a moldable plastic material,

each handle also including an elongated bail constituted of the same moldable plastic material as its respective base to form a one-piece molded plastic construction therewith, each bail having an end portion integrally and rigidly connected to both major surfaces of its respective base at a predetermined location thereon, an opposite end portion integrally and rigidly connected to both major surfaces of its respective base at another location thereon which is longitudinally spaced from the predetermined location, and an intermediate bight portion between the bail end portions and extending through a respective opening away from the upper end of the container,



each bail end portion having a tapered end which decreases in thickness towards both major surfaces of its respective base from a larger thickness to a smaller thickness which corresponds to said predetermined thickness of its respective base, each bail end portion having smooth opposite outer surfaces facing the respectively juxtaposed upper marginal portion and the hem,

each intermediate bight portion having a twisted hand-engaging portion which has a smooth lower surface facing the upper end of the container and which is free of sharp edges to facilitate gripping each handle and supporting the container; and

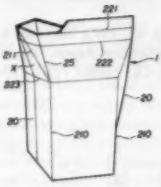
an adhesive layer applied over each major contact surface of each handle, for securely adhering the handles at the opposite sides of the container, each adhesive layer being located in the spaces between the respective contact surface and the respectively juxtaposed upper marginal portion and the hem to thereby impart an esthetically pleasing, generally flat appearance to the shopping bag both at its exterior upper marginal portion and at its interior hem which overlie the bail end portions.

4,450,581

CONVENIENCE CONTAINER WITH CORNERED BOTTOM

Isao Hirata, Sagamihara, Japan, assignor to Tokai Metals Company, Limited, Yokohama, Japan

Filed Nov. 3, 1982, Ser. No. 438,726
Claims priority, application Japan, Nov. 6, 1981, 56-177258
Int. Cl.³ B65D *73/02, 85/42*
U.S. Cl. 383—42 **19 Claims**



1. A method for making a convenience container having a cornered bottom, comprising:

(a) forming a pounch by:

(i) providing a generally rectangular blank of flexible pouch material, and folding that blank into the form of a pouch that is medially W-shaped in vertical cross-sectional shape, along three substantially parallel, laterally extending lines so as to superimpose both ends of the blank along the upper margin of the pouch form and so as to dispose the central one of the three fold lines as a single top fold line located intermediate the height of the pouch form and the other two of the three fold lines as two bottom fold lines located at the bottom edge of the pouch form, thereby defining an outer front panel, an inner front panel, an inner rear panel and an outer rear panel; all four of these panels having superimposed left margins and superimposed right margins although the left and right margins of said inner panels are not as tall as the left and right margins of said outer panels;

(ii) sealing the left margins of said outer panels to one another therealong above said single top fold line and sealing the right margins of said outer panels to one another therealong above said single top fold line;

(iii) sealing the outer front panel to the inner front panel at the left and at the right, and the outer rear panel to the inner rear panel at the left and at the right, along four respective oblique lines each running obliquely upwardly generally from the bottom edge of the pouch form from a point substantially short of half way across the width of the pouch form, to the respective side margin of the pouch form;

(b) forming a blank for a flexible outer shell for the pouch by:

(i) providing a generally rectangular blank of flexible outer shell material having a height which is substantially equal to the height of said pouch, and a width which is somewhat greater than twice the lateral distance across said pouch neglecting the sealed side margins of the pouch;

(ii) providing two substantially vertical fold lines on said rectangular blank flexible outer shell material intermediate the width of said rectangular blank, these two fold lines being laterally spaced from one another by a distance which is substantially equal to the lateral distance across said pouch neglecting the sealed margins of the pouch;

(iii) defining three bonding strips on said rectangular blank of flexible outer shell material, including a first one extending laterally along the upper margin thereof, a second one extending laterally along the lower margin thereof, and a third extending vertically along one side margin thereof;

(c) assembling the pouch with a flexible outer shell,

(i) superimposing said pouch upon said rectangular blank of flexible outer shell material so that the bottom edge of the pouch is superimposed on the second bonding strip, the sealed left margin of the pouch lies to the left of the leftmost one of said two substantially vertical fold lines, the sealed right margin of the pouch lies to the right of the rightmost one of said two substantially vertical fold lines, and the upper margin of the outer rear panel of the pouch is superimposed on the first bonding strip;

(ii) activating the first, second and third bonding strips; and

(iii) sequentially doubling over said rectangular blank of flexible outer shell material along said two substantially vertical fold lines, so as to perimetrically enclose said pouch with said rectangular blank of flexible outer shell material, bond said pouch to said blank along said first and second bonding strips and bond said rectangular blank of flexible outer shell material to itself along said third bonding strip,

(iv) providing four generally vertical container-assembling fold lines on said rectangular blank of flexible outer shell material, each extending upwards from the bottom edge of said rectangular blank of flexible outer shell material at a given lateral distance respectively to the left or the right of one or the other of said two substantially vertical fold lines laterally to the vicinity of said first bonding strip, said given distance being substantially equal to the lateral distance from where each of said four respective oblique lines intersects the bottom edge of said pouch at the respective said point, to the respective sealed side margin of the pouch, neglecting the width of the respective sealed side margin of the pouch, and thereby defining a generally flat fronted/flat backed,

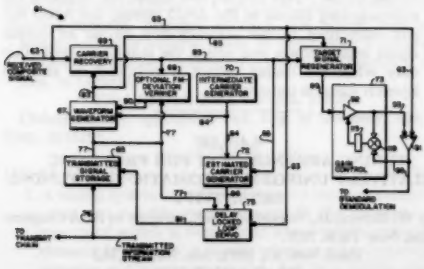
open topped/closed bottomed article which may be filled through its open top, in connection with medially bulging its front and back away from one another along said four generally vertical container-assembling fold lines and moving said two substantially vertical fold lines laterally towards one another at least below said first bonding strip, and bulging the bottom of the pouch centrally downwards along said single top fold line to provide a generally flat, cornered bottom of the pouch.

4,450,582

METHOD AND APPARATUS FOR INCREASING THE CAPACITY OF A SATELLITE TRANSPONDER BY REUSE OF BANDWIDTH

Steven P. Russell, Palo Alto, Calif., assignor to Vitalink Communications Corporation, Mountain View, Calif.

Filed Sep. 14, 1981, Ser. No. 301,566
Int. Cl.³ H04B 7/185
U.S. Cl. 455—12 **17 Claims**



1. A method of communicating between correspondent pairs of earth stations through an earth orbiting satellite and comprising,

transmitting signals from the earth stations simultaneously in channels that have at least a partial overlap in bandwidth,

retransmitting from the satellite to the earth stations a composite signal which is a composite of the signals transmitted by the two earth stations,

storing at each receiving earth station information constituting a base band representation of the signal transmitted by the receiving earth station,

delaying the stored information by an amount of time equal to the satellite round trip delay,

preparing an estimate of the portion of the composite signal that is transmitted by the receiving earth station by processing the composite signal using the stored information,

subtracting from the composite signal received at each earth station the portion of the composite signal transmitted by that earth station to provide a desired signal corresponding to the signal transmitted by the other earth station of the correspondent pair, and

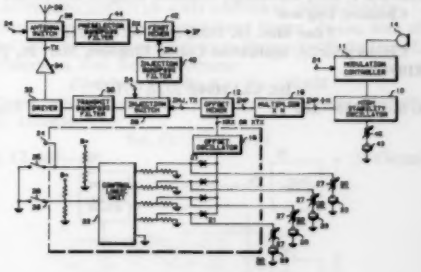
demodulating the desired signal.

4,450,583

MULTI-CHANNEL TRANSCEIVER USING A SINGLE HIGH-STABILITY ELEMENT

Russell A. Strobel, Sunrise, Fla.; Jawdat Rihani, Cairo, Egypt, and Richard E. Lunquist, Pompano Beach, Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Nov. 23, 1981, Ser. No. 324,205
Int. Cl.³ H04B 1/40
U.S. Cl. 455—86 **19 Claims**



1. A method of producing a transmission signal and a local-oscillator signal in a transceiver comprising the steps of:

(a) producing an input signal at a frequency that is maintained with relatively high stability;

(b) producing an offset signal at a frequency that is maintained with relatively low stability;

(c) mixing the input signal and the offset signal to produce a sum and difference signal, one of said sum and difference signal representing an injection signal and the other of said sum and difference signal representing the transmission signal;

(d) selecting the transmission signal to transmit from a transmitter portion of the transceiver; and

(e) selecting the injection signal to serve as the local-oscillator signal for a receiver portion of the transceiver.

4,450,584

MICROWAVE INTEGRATED CIRCUIT MIXER

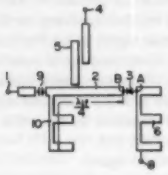
Hiroshi Saka, Kyoto, and Toshihide Tanaka, Ikoma, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Jun. 25, 1982, Ser. No. 392,158

Claims priority, application Japan, Jun. 30, 1981, 56-102830; Jun. 30, 1981, 56-102842

Int. Cl.³ H04B 1/26

U.S. Cl. 455—325 **9 Claims**



1. A single-ended microwave integrated circuit stripline or microstrip mixer, comprising a main line which connects an RF signal input terminal to one end of a mixer diode to transmit an RF signal to said mixer diode; means for applying an LO signal to said mixer diode; a first low-pass filter connected to the other end of said mixer diode for taking out an IF signal with a frequency equal to the difference between the frequencies of said RF signal and said LO signal; an IF signal interruption circuit provided in the RF signal path said main line and to pass said RF signal and provide an open-circuit impedance against said IF signal; and a second low-pass filter connected to said main line in the vicinity of said IF signal interruption circuit at a point distant from a mount point of said mixer diode to said main line for short-circuiting said IF siganl at said mount point.

4,450,585

SIGNAL SWITCHING AND COMBINING SYSTEMS FOR DIVERSITY RADIO RECEIVING SYSTEMS

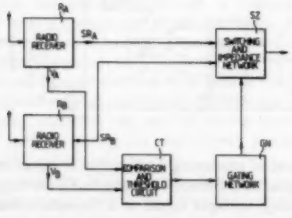
Howard T. Bell, Edinburgh, Scotland, assignor to Ferranti plc, Cheshire, England

Filed Mar. 18, 1982, Ser. No. 359,312

Claims priority, application United Kingdom, Mar. 26, 1981, 8109470

Int. Cl.³ H04B 1/16, 7/02

U.S. Cl. 455—135 **8 Claims**



1. A signal switching and combining system for a radio communication system having two receivers each providing a coherent radio signal output and an output proportional to the signal to noise ratio of the radio signal, the two radio signals being approximately in phase and of approximately equal amplitude, which includes a comparator operable to determine at any instant which of the two signal to noise ratio outputs is greater, a threshold detector including means for determining the difference between the signal to noise ratios and operable to determine whether at any instant the difference between the two signal to noise ratios exceeds either of two of predetermined threshold levels, a gating network responsive to the output of the comparator and of the threshold detector to derive one or more control signals, a switching circuit responsive to said one or more control signal outputs to connect to an output load either one of the coherent radio signals or a combination of the two coherent radio signal outputs in one of a number of predetermined ratios, and a matching network connected to the switching circuit for presenting an electrical impedance and a radio signal amplitude to the load such that said impedance and signal amplitude remain substantially constant.

4,450,586

AUTOMATIC TUNING DEVICE FOR FM RECEIVER

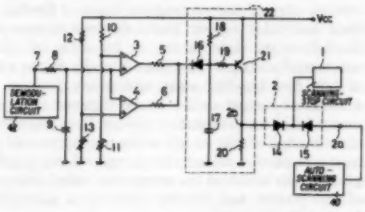
Shoji Fujino, Tokyo, Japan, assignor to Nippon Atsudenki Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 266,386, May 22, 1981, abandoned. This application Sep. 30, 1982, Ser. No. 429,826

Claims priority, application Japan, May 26, 1980, 55-72175

Int. Cl.³ H03J 7/18

U.S. Cl. 455—161 **4 Claims**



1. An automatic tuning device of a FM receiver comprising:

an auto-scanning circuit for outputting a squelch signal,

a scanning-stop circuit for outputting a tuning-stop signal,

an integrating circuit, a demodulation circuit, means for coupling the demodulation circuit to the integrating circuit, the integrating circuit extracting a DC component from a demodulation signal outputted from the demodulation circuit, within a constant range around a tuning frequency,

a window comparator and means for coupling the integrating circuit to the window comparator, the window comparator detecting whether or not the DC component is within the range to output the demodulated signal,

a timing circuit and means for coupling the window comparator to the timing circuit, the timing circuit being switched on by the demodulated signal outputted from the window comparator being continued for a given time, and

an AND circuit, means for coupling the scanning-stop circuit to the AND circuit, means for coupling the timing circuit to the AND circuit, and means for coupling the auto-scanning circuit to the AND circuit, the AND circuit outputting to the scanning-stop circuit an output signal which brings into action the scanning-stop circuit only when the timing circuit is switched on and the squelch signal is outputted.

4,450,587

TUNING ARRANGEMENT FOR PROVIDING RELATIVELY UNIFORM AUTOMATIC FINE TUNING SENSITIVITY

Billy W. Beyers, Jr., Greenfield, Ind., assignor to RCA Corporation, New York, N.Y.

Filed Nov. 27, 1981, Ser. No. 325,313

Int. Cl.³ H04B 1/26

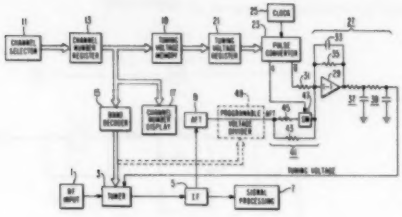
U.S. Cl. 455—182 **6 Claims**

1. In a receiver including a channel selector for selecting a channel from a plurality of channels, a tuner responsive to the

magnitude of a tuning voltage for selecting and heterodyning the RF signal corresponding to the selected channel to produce an IF signal including an information bearing carrier, and an automatic fine tuning (AFT) circuit responsive to said IF signal for producintg a continuous AFT voltage which by its polarity and magnitude represents the sense and magnitude of a deviation between the frequency of said information bearing carrier and a nominal value, apparatus comprising:

register means coupled to said channel selector for storing a digital word representing the magnitude of the tuning voltage corresponding to the selected channel;

pulse converter means for converting said digital word to a pulse signal having pulses the duration which is related to the magnitude of said tuning voltage for the selected channel;



filter means responsive to said pulse signal and said AFT voltage for producing said tuning voltage in accordance with the average value of said pulse signal as modified by the amplitude of said AFT voltage;

switchable impedance means included within said filter means for controlling a gain factor of said filter means and selectively having one of first and second different impedance values which define respective different effective amplitudes of said AFT voltage by which said tuning voltage is modified by said AFT voltage; and

switchable impedance control means coupled to said switchable impedance means and responsive to said pulse signal for causing said switchable impedance to have said first impedance value during the entire duration of each of said pulses of said pulse signal and said second impedance value during the entire duration of each interval between adjacent ones of said pulses of said pulse signal.

4,450,588

TUNING SYSTEM FOR A HIGH FREQUENCY RECEIVER UTILIZING A CONTROLLABLE INDUCTOR

Manfred Röhrich, Marxzell-Burbach, and Stefan Brinkhaus, Remchingen-Wilferdingen, both of Fed. Rep. of Germany, assignors to Becker Autoradiowerk GmbH, Ittersbach, Fed. Rep. of Germany

Filed Apr. 14, 1982, Ser. No. 368,316

Claims priority, application Fed. Rep. of Germany, Apr. 15, 1981, 3115291

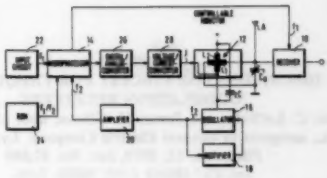
Int. Cl.³ H04B 1/16

U.S. Cl. 455—192 **22 Claims**

1. A tuning system for a high frequency receiver comprising

at least one tunable resonance circuit the resonance frequency of which is determined by a variable inductivity element formed by a signal winding of a controllable inductor and a control winding fed by a tuning control current,

an auxiliary variable frequency oscillator having an oscillating frequency determined by said control winding, said control winding being used as a frequency determinative inductance of said auxiliary variable frequency oscillator; and a frequency control loop connected between said auxiliary variable frequency oscillator and said resonant circuit for controlling said oscillating frequency of said auxiliary variable frequency oscillator for a predetermined constant ratio of said resonance frequency of said tunable resonance circuit to said oscillating frequency, said frequency control loop comprising



comparing means for comparing a frequency value corresponding to said resonance frequency of said tunable resonance circuit with said oscillating frequency of said auxiliary variable frequency oscillator and generating a control signal representing the difference between said resonance and oscillating frequencies, and

converting means for converting said control signal into said control current for feeding said control winding of said controllable inductor.

4,450,589

FM RECEIVER FOR RECEPTION OF SPECIAL ANNOUNCEMENTS AND GENERAL PROGRAMS

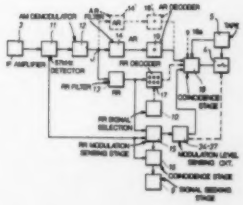
Norbert Eilers, Hildesheim, and Peter Brägas, Itzum, both of Fed. Rep. of Germany, assignors to Blaupunkt-Werke GmbH, Hildesheim, Fed. Rep. of Germany

Filed Nov. 9, 1981, Ser. No. 319,655

Claims priority, application Fed. Rep. of Germany, May 27, 1981, 3121034

Int. Cl.³ H04B 1/16

U.S. Cl. 455—205 **34 Claims**



29. For use in an FM radio receiver having a tuner, an RF stage, an output audio stage including switching means switchable among various audio signal sources in addition to the FM receiver, the improvement comprising means for detecting amplitude modulation of an auxiliary subcarrier at a prese-

lected frequency of a first recognition signal and for producing an output when the percent amplitude of modulation level of the first recognition signal is below a predetermined value, and means responsive to the output from said means for detecting for controlling said switching means to connect the receiver to its audio stage when said modulation below the predetermined value is detected.

4,450,590

DISCRIMINATOR CIRCUIT FOR FREQUENCY MODULATION RECEIVERS

Edwin C. Lafferty, and James H. Gibson, both of Lynchburg, Va., assignors to General Electric Company, Lynchburg, Va.

Filed Jun. 12, 1979, Ser. No. 47,689

Int. Cl.[3] **H03D** *3/02;* **H03K** *9/06*

U.S. Cl. 455—214 **5 Claims**

1. An improved discriminator for demodulating frequency modulated information on a relatively low frequency carrier signal comprising:

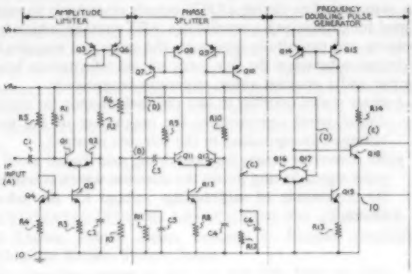
a. an input for said low frequency carrier signal;

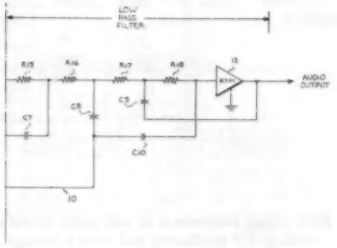
b. an amplitude limiter connected to said imput;

c. a phase splitter connected to said amplitude limiter for producing two signals having a phase difference of substantially 180 degrees, and each having substantially the same frequency as said low frequency carrier signal;

d. a frequency doubling pulse generator connected to said phase splitter for producting a sequence of pulses whose frequency is twice the frequency of said low frequency signal, and whose average direct current value varies inversely as a function of the frequency of said low frequency signal;

inversely as a function of the frequency of said low frequency signal;





e. and a low pass filter connected to said frequency doubling pulse generator for producing an audio output.

DESIGN PATENTS

GRANTED MAY 22, 1984

ERRATA

For CLASS	See PATENT NO.
D14–060	273,909

273,909

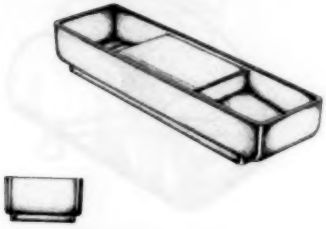
TELEPHONE STAND

Donald M. Genaro, Haworth, N.J.; John N. McGarvey, Drexel Hill, Pa., and Alvin R. Tilley, Red Bank, N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jan. 5, 1983, Ser. No. 455,912

Term of patent 14 years

U.S. Cl. D14—60



273,910

FISHING VEST WITH INTEGRAL HOOD

Jim A. Teeny, 2281 SE. Kelly, Gresham, Oreg. 97030

Filed Feb. 12, 1982, Ser. No. 348,603

Term of patent 14 years

U.S. Cl. D2—186

273,911

GARMENT BAG

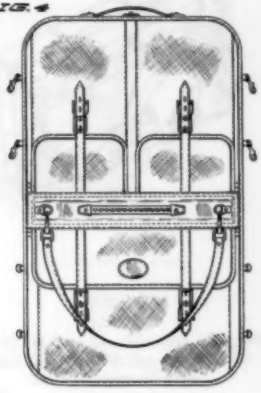
Joseph Y. Pelavin, North Bergen, N.J., assignor to CPG Products Corp., Minneapolis, Minn.

Filed May 4, 1981, Ser. No. 260,225

Term of patent 14 years

U.S. Cl. D3—71

FIG. 4



273,912

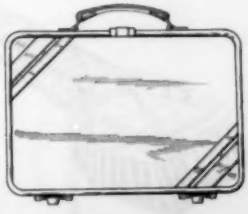
LUGGAGE CASE

Michael Davis, New Castle, Pa., assignor to Airway Industries, Inc., Ellwood City, Pa.

Filed Mar. 5, 1982, Ser. No. 354,147

Term of patent 14 years

U.S. Cl. D3—71



273,913

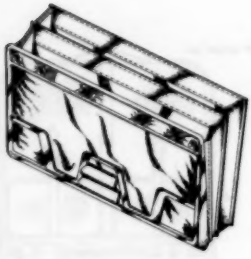
PORTFOLIO FOR AN ATTACHE CASE OR THE LIKE

Mark B. Nordstrom, Denver, and David E. Workman, Evergreen, both of Colo., assignors to Samsonite Corporation, Denver, Colo.

Filed Jan. 27, 1982, Ser. No. 343,255

Term of patent 14 years

U.S. Cl. D3—76



273,914

BRUSH

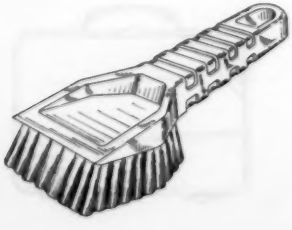
Robin V. Colemore-Williams, Auckland, New Zealand, assignor to Merryware Industries, Ltd., Auckland, New Zealand

Filed Apr. 24, 1981, Ser. No. 257,480

Claims priority, application New Zealand, Mar. 26, 1980, 16478

Term of patent 14 years

U.S. Cl. D4—12



273,915

INVERTIBLE LEG REST

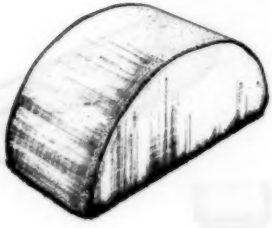
Douglas C. M. Pike, Sudbury, England, assignor to Cloche Houses Limited, England

Filed Oct. 5, 1981, Ser. No. 308,665

Claims priority, application United Kingdom, Apr. 9, 1981, 999911

Term of patent 14 years

U.S. Cl. D6—3



273,916

CHAIR

Edsel E. Murry, Christiana, Tenn., assignor to Samsonite Corporation, Denver, Colo.

Filed Nov. 4, 1982, Ser. No. 439,083

Term of patent 14 years

U.S. Cl. D6—26

273,917
CHAIR

Charles W. Pelly, Calabasas, and John Krieger, Palos Verdes Estates, both of Calif., assignors to Unitex Corporation, Monrovia, Calif.

Filed Feb. 12, 1982, Ser. No. 348,567
Term of patent 14 years
U.S. Cl. D6—30

273,918
PEDESTAL BASED ARM CHAIR

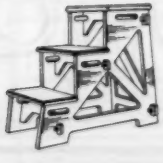
Robert A. Keeler, Grand Rapids, Mich., assignor to Steelcase, Inc., Grand Rapids, Mich.

Filed Dec. 7, 1981, Ser. No. 328,459
Term of patent 14 years
U.S. Cl. D6—31

273,919
STEP STOOL, OR SIMILAR ARTICLE

Ralph R. Pasinski, 777 S. Matilda, Apt. 135, Sunnyvale, Calif. 94087

Filed Feb. 2, 1982, Ser. No. 344,993
Term of patent 14 years
U.S. Cl. D6—32



273,920
SEAT FOR MOTOR CAR OR THE LIKE

Michel Tixier, Boulogne Billancourt, France, assignor to Regie Nationale des Usines Renault, Boulogne, France

Filed Sep. 9, 1981, Ser. No. 300,473
Claims priority, application France, Mar. 31, 1981, 811182
Term of patent 14 years
U.S. Cl. D6—48

273,921
TABLE

Gail S. Woolaway, 18 Glen Dr., Sausalito, Calif. 94965

Filed Sep. 14, 1981, Ser. No. 301,952
Term of patent 14 years
U.S. Cl. D6—57

273,922
DISPOSABLE CHAIR

Francois M. Geneve; Luc M. D. Heiligenstein, and Stephen B. Melamed, all of Chicago, Ill., assignors to Tres Design Co., Inc., Chicago, Ill.

Filed May 27, 1983, Ser. No. 498,748
Term of patent 14 years
U.S. Cl. D6—66

273,923

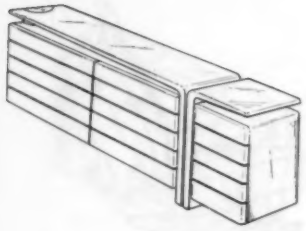
CREDENZA

Jan H. Matthias, Beverly Hills, Calif., assignor to Casa Bella Imports, Inc., Miami, Fla.

Filed Jan. 19, 1982, Ser. No. 340,885

Term of patent 14 years

U.S. Cl. D6—166



273,924

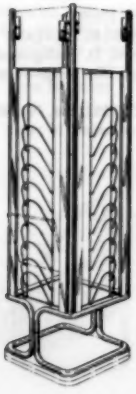
DISPLAY RACK FOR RECORD ALBUM, VIDEO DISC OR SIMILAR ARTICLE

Myron L. Denhoff, New York, N.Y., assignor to Myden Industries, Inc., New York, N.Y.

Filed Sep. 24, 1981, Ser. No. 305,156

Term of patent 14 years

U.S. Cl. D6—188



273,925

BASE FOR A BUSINESS CHAIR

Jerome Caruso, Lake Forest, Ill., assignor to Litton Business Systems, Inc., York, Pa.

Division of Ser. No. 142,259, Apr. 21, 1980. This application Sep. 2, 1982, Ser. No. 414,428

Term of patent 14 years

U.S. Cl. D6—196

273,926

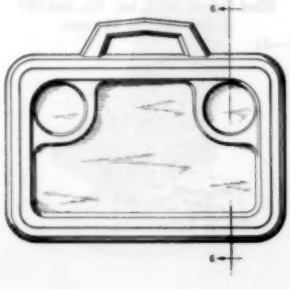
COMBINED STADIUM SEAT AND TRAY

James E. Byrns, 86 Sixteenth Ave. N., Clinton, Iowa 42732, and Samuel W. Williams, 807 W. Summit, Maquoketa, Iowa 52060

Filed Oct. 13, 1981, Ser. No. 311,151

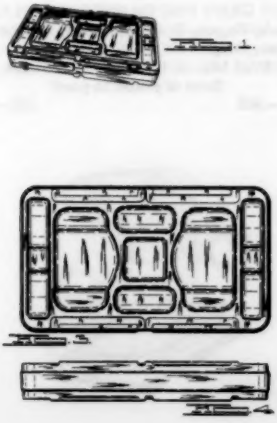
Term of patent 14 years

U.S. Cl. D6—201

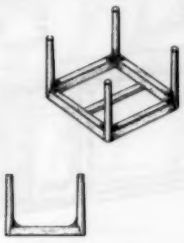


273,927
FOOD BOWL
Lawrence M. Knutson, Prior Lake, Minn., assignor to Decra Stone, Inc., Prior Lake, Minn.
Filed Jun. 20, 1980, Ser. No. 161,313
Term of patent 14 years
U.S. Cl. D7—1

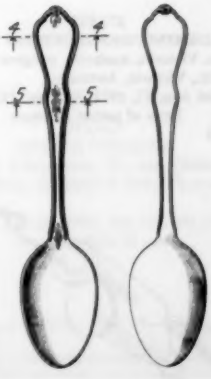
273,928
INSULATED FOOD SERVICE TRAY
Richard A. Tarozzi, Gales Ferry, Conn., assignor to King-Seeley Thermos Co., Norwich, Conn.
Filed Nov. 16, 1981, Ser. No. 321,908
Term of patent 14 years
U.S. Cl. D7—38



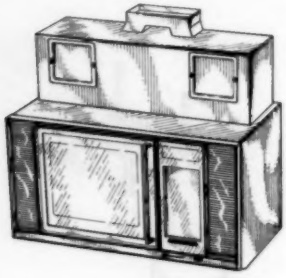
273,929
COMBINED TACO HOLDER AND SERVER
Ernest P. Rolli, Jr., c/o Del-Rey Manufacturing, Inc., 9282 Arlington Rd., Brookville, Ohio 45309, assignor to Ernest P. Rolli, Jr. and Robert Hood, both of Brookville, Ohio, a part interest
Filed Dec. 28, 1981, Ser. No. 334,960
Term of patent 14 years
U.S. Cl. D7—76



273,930
SPOON OR SIMILAR ARTICLE
Colin B. Richmond, II, Oneida, N.Y., assignor to Oneida Ltd., Oneida, N.Y.
Filed Jun. 24, 1982, Ser. No. 391,947
Term of patent 14 years
U.S. Cl. D7—137



273,931
COMBINATION MICROWAVE OVEN AND EXHAUST VENT HOOD
James P. Stevens, Oak Park, and Chester J. Wojtowicz, Prospect Height, both of Ill., assignors to Amana Refrigeration, Inc., Amana, Iowa
Filed Jan. 15, 1982, Ser. No. 339,743
Term of patent 14 years
U.S. Cl. D7—351



273,932
COMBINED WATER BRACKET AND CAM-TYPE LATCH
H. Gordon Gates, Denver, Colo., assignor to Gates & Sons, Inc., Denver, Colo.
Filed Jun. 15, 1981, Ser. No. 273,482
Term of patent 14 years
U.S. Cl. D8—330

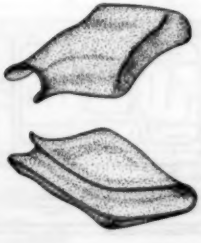
273,933
SOLDERING/DESOLDERING TOOL
Alan L. Royston, Victoria, Australia, assignor to Royel International Pty. Ltd., Victoria, Australia
Filed Aug. 17, 1981, Ser. No. 293,507
Term of patent 14 years
U.S. Cl. D8—30

273,934
CHAIN SAW GUARD
Henry J. Servicky, 4420 W. 51st St., Cleveland, Ohio 44144
Filed Sep. 3, 1981, Ser. No. 298,871
Term of patent 14 years
U.S. Cl. D8—70

FIG. 1

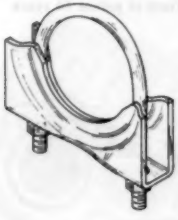
273,935
BICYCLE HANDGRIP
Gary Bolster, and Chris Shepley, both of Walla Walla, Wash., assignors to Neotech International Corporation, Walla Walla, Wash.
Filed Jan. 11, 1982, Ser. No. 338,429
Term of patent 14 years
U.S. Cl. D8—303

273,936
SET OF GRIPS FOR BICYCLE HANDLEBARS
Rainer Schmid, Eugene, Oreg., assignor to Orthopedic Design, Inc., Eugene, Oreg.
Filed Mar. 3, 1982, Ser. No. 354,198
Term of patent 14 years
U.S. Cl. D8—303



273,937
STRIKE PLATE OR SIMILAR ARTICLE
Robert O. Ruff, Cincinnati, Ohio, assignor to American Standard, Inc., New York, N.Y.
Filed Dec. 27, 1982, Ser. No. 453,204
Term of patent 14 years
U.S. Cl. D8—344

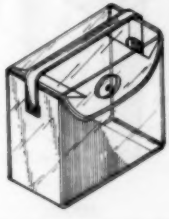
273,938
MUFFLER CLAMP
Michael H. Piper, 6901 SE. 14th St., Apt. 158, Des Moines, Iowa 50320
Filed Jul. 31, 1981, Ser. No. 289,000
Term of patent 14 years
U.S. Cl. D8—396



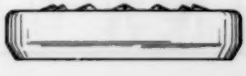
273,939
COMBINED BELLOWS PUMP AND FLUID DISPENSING CONTAINER
Robert Bennett, 170 Sturbridge Rd., Easton, Conn. 06425
Continuation-in-part of Ser. No. D. 292,651, Aug. 13, 1981. This application Sep. 18, 1981, Ser. No. 303,352
Term of patent 14 years
U.S. Cl. D9—301

273,940
CONTAINER FOR LIQUIDS
Vili Soos, Toronto, Canada, and Edmund A. Weaver, Racine, Wis., assignors to S. C. Johnson & Son, Inc., Racine, Wis.
Filed Dec. 10, 1981, Ser. No. 329,450
Term of patent 14 years
U.S. Cl. D9—337

273,941
PRODUCT PACKAGING CONTAINER
Maurice Farber, Memphis, Tenn., assignor to Farber Brothers, Inc., Memphis, Tenn.
Filed Dec. 28, 1981, Ser. No. 334,473
Term of patent 14 years
U.S. Cl. D9—420

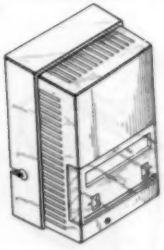


273,942
BOTTLE FERRULE
Daniel A. Brueck, Libertyville, Ill., and Charles J. Hershey, Crystal Falls, Mich., assignors to Abbott Laboratories, North Chicago, Ill.
Filed Jan. 25, 1982, Ser. No. 342,294
Term of patent 14 years
U.S. Cl. D9—434



273,943
CLOCK
John C. Dillon, Ridgewood, N.J., assignor to SportsClocks, Inc., Charlotte, N.C.
Filed May 17, 1982, Ser. No. 379,120
Term of patent 14 years
U.S. Cl. D10—6

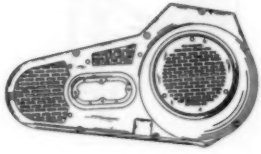
273,944
THERMOSTAT
David F. Koeneman, Mt. Prospect; Harold P. Adams, Norridge, both of Ill., and Robert W. Blee, Terrace Park, Ohio, assignors to Mark Controls Corporation, Evanston, Ill.
Filed Feb. 12, 1982, Ser. No. 348,420
Term of patent 14 years
U.S. Cl. D10—50



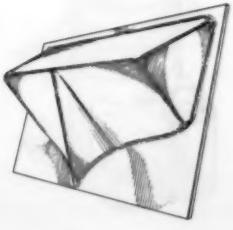
273,945
CAMBER MEASURING DEVICE
Clifford J. Homer, Attleboro, Mass., and Raymond Kaszyk, Pawtucket, R.I., assignors to Newman-Crosby Steel, Inc., Pawtucket, R.I.
Filed Oct. 26, 1981, Ser. No. 315,241
Term of patent 14 years
U.S. Cl. D10—65

273,946
INFILTROMETER
Wayne C. T. Cole, Winnipeg, Canada, assignor to Ener-Corp. Management Limited, Winnipeg, Canada
Filed Nov. 18, 1981, Ser. No. 322,591
Claims priority, application Canada, May 19, 1981, D19-05-81
Term of patent 14 years
U.S. Cl. D10—96

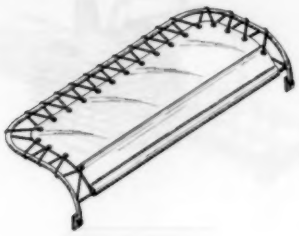
273,947
OPEN MOTORCYCLE PRIMARY COVER
Stanley A. Johnson, Brookfield, Wis., assignor to Harley-Davidson Motor Co., Inc., Milwaukee, Wis.
Filed Mar. 22, 1982, Ser. No. 360,588
Term of patent 14 years
U.S. Cl. D12—127



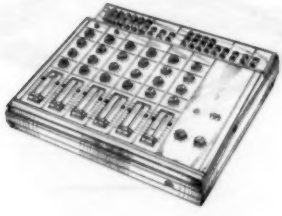
273,948
WIND DEFLECTOR FOR VEHICLES
Erven R. Walker, 633 Shadydale, La Puente, Calif. 91744
Filed Oct. 6, 1980, Ser. No. 194,363
Term of patent 14 years
U.S. Cl. D12—181



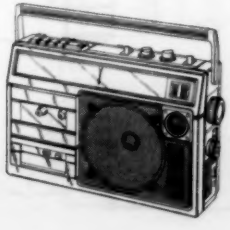
273,949
SAILBOAT PLATFORM
Steven H. Curran, 7514 W. 91st St., Los Angeles, Calif. 90045, and Alfred G. Kumalae, 2616 Clay, Newport Beach, Calif. 92660
Filed Jan. 29, 1982, Ser. No. 343,774
Term of patent 14 years
U.S. Cl. D12—317



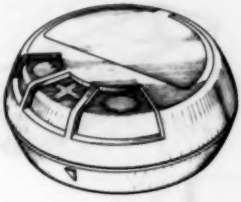
273,950
AUDIO MIXER
Masafumi Itoh; Sigeru Hasegawa; Haruki Takita, all of Musashino, and Kouzi Suzuki, Niza, all of Japan, assignors to Teac Corporation, Musashino, Japan
Filed Nov. 4, 1981, Ser. No. 318,206
Claims priority, application Japan, Jul. 14, 1981, 56-30931
Term of patent 14 years
U.S. Cl. D14—1



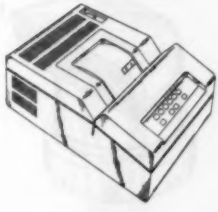
273,951
COMBINED RADIO AND CASSETTE TAPE RECORDER
Teruyuki Nishimoto, Osaka, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Oct. 6, 1981, Ser. No. 309,137
Claims priority, application Japan, Apr. 8, 1981, 56-15033
Term of patent 14 years
U.S. Cl. D14—5



273,952
EMERGENCY TELEPHONE DIALING PAD
Benjamin H. Stansbury, Jr., Beverly Hills, and Lanny A. Gorton, Sunland, both of Calif., assignors to Mattel, Inc., Hawthorne, Calif.
Filed Feb. 2, 1982, Ser. No. 345,185
Term of patent 14 years
U.S. Cl. D14—66

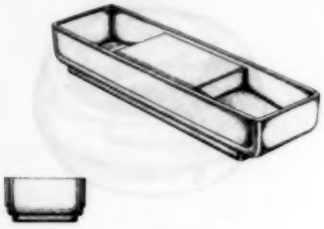


273,953
INTERACTIVE TERMINAL PRINTER
Donald F. Lahey, Saratoga, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.
Filed Sep. 14, 1981, Ser. No. 300,781
Term of patent 14 years
U.S. Cl. D14—111

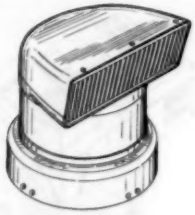


273,954
ATTENDANT CONSOLE
James W. M. Bee, Palo Alto, Calif., assignor to Northern Telecom Limited, Montreal, Canada
Filed Oct. 28, 1981, Ser. No. 315,886
Term of patent 14 years
U.S. Cl. D14—58

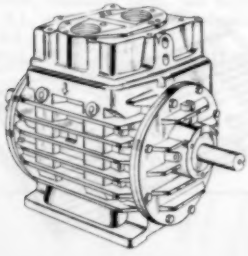
273,955
TELEPHONE STAND
Kenneth B. Brown, Jr., Greenwood, Ind.; Donald M. Genaro, Haworth, N.J.; John N. McGarvey, Drexel Hill, Pa., and Alvin R. Tilley, Red Bank, N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.
Filed Jan. 5, 1983, Ser. No. 455,880
Term of patent 14 years
U.S. Cl. D14—60



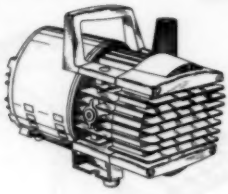
273,956
AIR PRECLEANER FOR AN INTERNAL COMBUSTION ENGINE
Ross K. Petersen, c/o Medalie Manufacturing Co. 4701 Humboldt Ave. N., Minneapolis, Minn. 55430
Filed Jul. 31, 1981, Ser. No. 289,045
Term of patent 14 years
U.S. Cl. D15—5



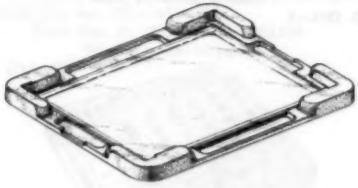
273,957
AIR PUMP
Gordon H. Boswell, Auckland, New Zealand, assignor to Mason & Porter Limited, Auckland, New Zealand
Filed Jun. 30, 1980, Ser. No. 163,997
Term of patent 14 years
U.S. Cl. D15—9



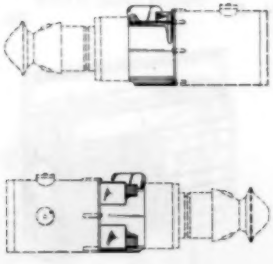
273,958
PORTABLE AIR COMPRESSOR
James F. Mariol, 481 Deanview Dr., Cincinnati, Ohio 45224
Filed Apr. 9, 1982, Ser. No. 367,089
Term of patent 14 years
U.S. Cl. D15—9



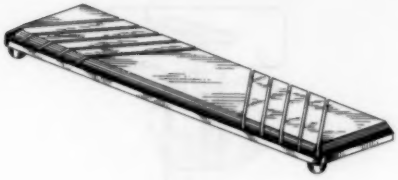
273,959
TRANSPARENCY FRAME FOR OVERHEAD PROJECTOR
Peter VanDyken, Jr., 235 S. A St., Tustin, Calif. 92680
Filed Dec. 7, 1981, Ser. No. 328,455
Term of patent 14 years
U.S. Cl. D16—26



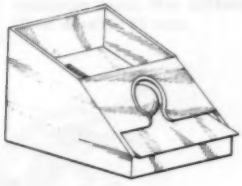
273,960
BATTERY HOUSING OF RIFLE SCOPE OR SIMILAR ARTICLE
Carl P. Kummer, Winter Park, Fla., assignor to Applied Devices Corporation, Kissimmee, Fla.
Filed Jun. 25, 1981, Ser. No. 277,185
Term of patent 14 years
U.S. Cl. D16—132



273,961
MULTIPLE GREETING CARD HOLDER
Karolin M. Bassey, 20 Moonlawn Rd., Troy, N.Y. 12180
Filed Sep. 25, 1981, Ser. No. 305,546
Term of patent 14 years
U.S. Cl. D19—90



273,962
DISPENSER FOR PLAYING CARDS OR THE LIKE
Stephen J. Fromm, 533 N. Shore Rd., Absecon, N.J. 08201
Filed May 13, 1981, Ser. No. 263,213
Term of patent 14 years
U.S. Cl. D21—57

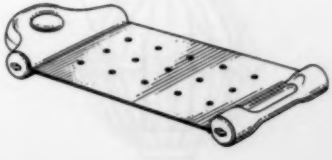


273,963
SCOOTER
Beltram F. O. Mayers, 986 McBride Ave., Mississauga, Ontario, Canada (L5C 1L6)
Filed Mar. 31, 1982, Ser. No. 328,659
Claims priority, application Canada, Dec. 23, 1981, 2312812
Term of patent 14 years
U.S. Cl. D21—81

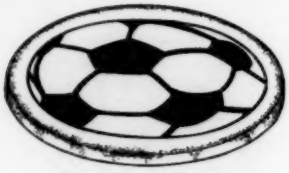
273,964
SIMULATIVE TOY JIGSAW PUZZLE OR SIMILAR ARTICLES
Daniel L. Roth, 914 Fleetwood Place Dr., Houston, Tex. 77079
Filed Feb. 11, 1982, Ser. No. 347,956
Term of patent 14 years
U.S. Cl. D21—104

273,965
SHUTTLECOCK
Kent Lin, No. 131, Yuyuan Rd., Shinjuang Village, Lonjing County, Taichun Hsian, Taiwan
Filed Jan. 4, 1982, Ser. No. 336,594
Term of patent 14 years
U.S. Cl. D21—207

273,966
FLOATING MATTRESS
Ralph H. Piel, 16605 Oldham St., Encino, Calif. 91316
Filed Oct. 29, 1981, Ser. No. 316,133
Term of patent 14 years
U.S. Cl. D21—237



273,967
SWING SEAT
Donald F. Budde, St. Louis, Mo., assignor to Urethane Roller Specialists, Inc., Eureka, Mo.
Filed Mar. 6, 1981, Ser. No. 241,438
Term of patent 14 years
U.S. Cl. D21—246



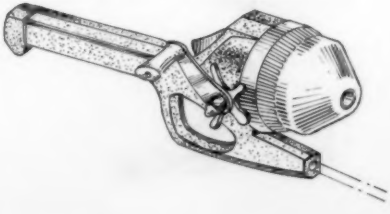
273,968
GOLF CLUB COVER
Betty K. Masai, Torrance, and Chikako Watanabe, Los Angeles, both of Calif., assignors to Masai and Watanabe, Los Angeles, Calif.
Filed Feb. 16, 1982, Ser. No. 349,004
Term of patent 14 years
U.S. Cl. D21—221

273,969
TRIANGULAR-SHAPED FISHING REEL HOLDER
Walter L. Hitchens, Knoxville, Tenn., assignor to Commercial Plastics & Supply Co., Inc., Cornwells Heights, Pa.
Filed Oct. 14, 1980, Ser. No. 196,894
Term of patent 14 years
U.S. Cl. D22—13

273,970
T-SHAPED FISHING REEL HOLDER
Walter L. Hitchens, Knoxville, Tenn., assignor to Commercial Plastics & Supply Co., Inc., Cornwells Heights, Pa.
Filed Oct. 14, 1980, Ser. No. 196,896
Term of patent 14 years
U.S. Cl. D22—13

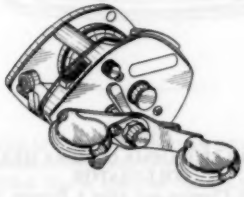
273,971
COLLAPSIBLE FISHING ROD HOLDER
Lester G. Nelson, Rural Route, and M. A. Windmueller, 405 Seventh Ave. West, both of Lemmon, S. Dak. 57638
Filed Apr. 5, 1982, Ser. No. 365,372
Term of patent 14 years
U.S. Cl. D22—13

273,972
COMBINED FISHING ROD HANDLE AND REEL
Robert W. Fee, Wichita, Kans., assignor to Brunswick Corporation, Skokie, Ill.
Filed Apr. 5, 1982, Ser. No. 364,032
Term of patent 14 years
U.S. Cl. D22—26

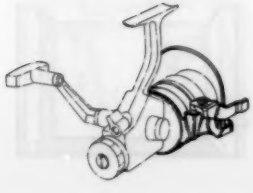


273,973
FISHING REEL
John J. Mack, Tulsa, Okla., assignor to Brunswick Corporation, Skokie, Ill.
Filed Jul. 22, 1982, Ser. No. 399,591
Term of patent 14 years
U.S. Cl. D22—25

273,974
FISHING REEL
Seiji Myojo, Sakai, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan
Filed Nov. 15, 1982, Ser. No. 441,782
Claims priority, application Japan, May 20, 1982, 57-22228
Term of patent 14 years
U.S. Cl. D22—25



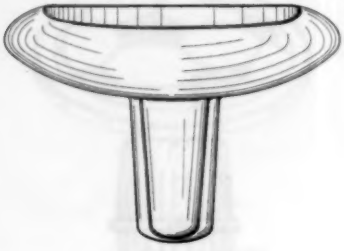
273,975
FISHING REEL BAIL ARM
Akinori Sakumoto, and Kanji Iinuma, both of Tokyo, Japan, assignors to Daiwa Seiko, Inc., Tokyo, Japan
Filed May 19, 1982, Ser. No. 379,816
Claims priority, application Japan, Dec. 29, 1981, 56-58707
Term of patent 14 years
U.S. Cl. D22—25



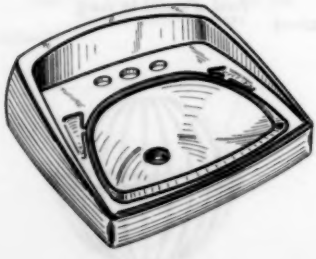
273,976
WATER RESERVOIR FOR A REVERSE OSMOSIS SYSTEM
Bruce D. Burrows, 25145 West Ave. Stanford, Valencia, Calif. 91355
Filed Sep. 15, 1981, Ser. No. 302,464
Term of patent 14 years
U.S. Cl. D23—2

273,977
WATER RESERVOIR FOR A REVERSE OSMOSIS SYSTEM
Bruce D. Burrows, 25145 West Ave. Stanford, Valencia, Calif. 91355
Filed Sep. 15, 1981, Ser. No. 302,466
Term of patent 14 years
U.S. Cl. D23—2

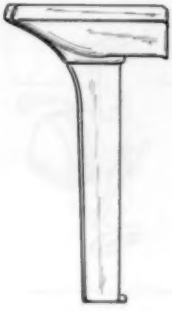
273,978
LAVATORY
Axel Enthoven, Wijnegen, Belgium, assignor to American Standard, Inc., New York, N.Y.
Filed Apr. 12, 1982, Ser. No. 367,326
Claims priority, application Fed. Rep. of Germany, Oct. 19, 1981, 20 MR 1910
Term of patent 14 years
U.S. Cl. D23—58

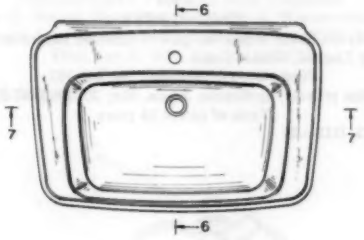


273,979
LAVATORY OR SIMILAR ARTICLE
Henry M. Stair, Jr., Neshanic, N.J., assignor to American Standard, Inc., New York, N.Y.
Filed Jun. 1, 1982, Ser. No. 383,424
Term of patent 14 years
U.S. Cl. D23—58

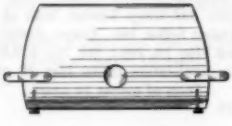


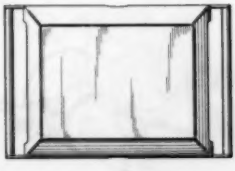
273,980
PEDESTAL LAVATORY OR THE LIKE
Jack N. Kaiser, Danville, Ky., assignor to American Standard, Inc., New York, N.Y.
Filed Jan. 7, 1982, Ser. No. 337,634
Term of patent 14 years
U.S. Cl. D23—61



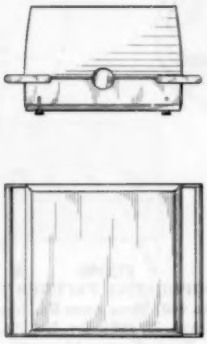


273,981
RECTANGULAR GAMMA CAMERA HEAD WITH COLLIMATOR
Edward A. Kroll, Chardon, and Allan J. Perusek, Mentor, both of Ohio, assignors to Technicare Corporation, Solon, Ohio
Continuation-in-part of Ser. No. 260,239, May 4, 1981. This application Aug. 11, 1981, Ser. No. 292,104
Term of patent 14 years
U.S. Cl. D24—02



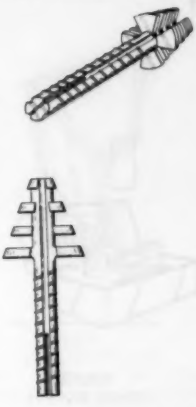


273,982
SQUARE GAMMA CAMERA HEAD WITH COLLIMATOR
Edward A. Kroll, Chardon, Ohio, assignor to Technicare Corporation, Solon, Ohio
Filed Aug. 11, 1981, Ser. No. 292,105
Term of patent 14 years
U.S. Cl. D24—02

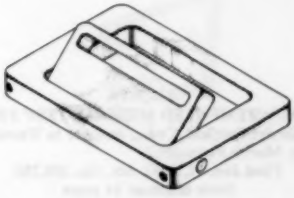


273,983
THERAPEUTIC INVERSION DEVICE
Wayne H. McGowen, 4930 Mill Creek, Dallas, Tex. 75234
Filed Mar. 4, 1983, Ser. No. 472,228
Term of patent 14 years
U.S. Cl. D24—3

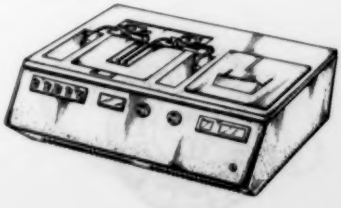
273,984
DENTAL POST
David G. Vlock, 12 Fifth Ave., New York, N.Y. 10011
Filed Dec. 30, 1981, Ser. No. 336,007
Term of patent 14 years
U.S. Cl. D24—10



273,985
DENTAL BURR TOOL HOLDER
Thomas J. Schulstad, 1450 Olympic View Dr., Edmonds, Wash. 98020
Filed Jan. 11, 1982, Ser. No. 338,232
Term of patent 14 years
U.S. Cl. D24—16



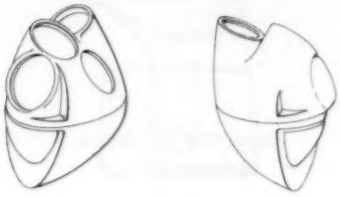
273,986
DESIGN FOR A BLOOD CLOT DETECTION INSTRUMENT
Edward J. Johnson, Furlong, Pa., assignor to Warner Lambert Technologies, Inc., Southbridge, Mass.
Division of Ser. No. 39,085, May 14, 1979. This application Jul. 8, 1981, Ser. No. 281,440
Term of patent 14 years
U.S. Cl. D24—17



273,987
REAGENT CASSETTE (OR THE LIKE)
James T. Holen, Mundelein; Julius S. Becker, Vernon Hills, and Robert Case, Chicago, all of Ill., assignors to Abbott Laboratories, North Chicago, Ill.
Filed Aug. 20, 1981, Ser. No. 294,664
Term of patent 14 years
U.S. Cl. D24—17

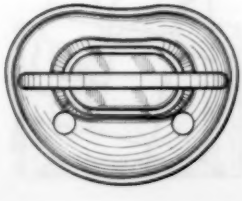
273,988
COMPARTMENTED MEDICAL TEST TRAY
Ernest F. Kiraly, Fairfield, Conn., assignor to Warner-Lambert Company, Morris Plains, N.J.
Filed Jan. 11, 1982, Ser. No. 338,756
Term of patent 14 years
U.S. Cl. D24—31

273,989
HUMAN ARTIFICIAL HEART
Didier Lapeyre, Chaignes 27120, Pacy sur Eure, France
Filed Sep. 11, 1981, Ser. No. 301,291
Claims priority, application France, Mar. 17, 1981, 810 969
Term of patent 14 years
U.S. Cl. D24—33

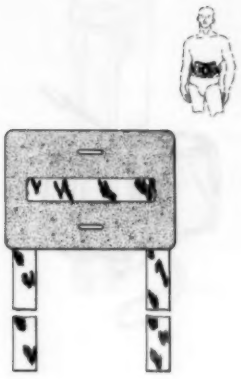


273,990
MANIPULATIVE PACIFIER TOY
Jeanne W. Lamsam, 4401 Shore Acres Rd., Monona, Wis. 53716
Filed Aug. 26, 1981, Ser. No. 296,554
Term of patent 14 years
U.S. Cl. D24—45

273,991
BABY SOOTHER
Ronald K. Moore, Kempsey, England, assignor to Lewis Woolf Griptight Limited, Birmingham, England
Filed Sep. 15, 1981, Ser. No. 302,461
Claims priority, application United Kingdom, Jun. 25, 1981, 1001183
Term of patent 14 years
U.S. Cl. D24—46

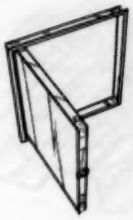


273,992
ANTI-SEASICKNESS BELT DEVICE
Leo J. Burby, 2851 E. Overlook Rd., Cleveland, Ohio 44118, and Henry P. Evans, 17618 Walnut Trail, Chagrin Falls, Ohio 44022
Filed Nov. 16, 1981, Ser. No. 321,637
Term of patent 14 years
U.S. Cl. D24—99

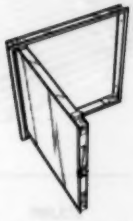


273,993
CATHETER CLIP
Rudolf R. Schulte, Santa Barbara, and Alfons Heindl, Goleta, both of Calif., assignors to Pudenz-Schulte Med, Research Corp., Goleta, Calif.
Filed Feb. 5, 1982, Ser. No. 346,367
Term of patent 14 years
U.S. Cl. D24—99

273,994
ACCESS DOOR
Hiromitsu Naka, Yashio, Japan, assignor to Kabushiki Kaisha Naka Gijutsu Kenkyusho, Sapporo, Japan
Filed Jan. 4, 1982, Ser. No. 336,588
Term of patent 14 years
U.S. Cl. D25—48

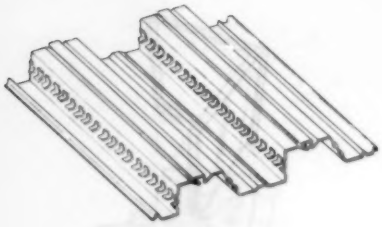


273,995
ACCESS DOOR
Hiromitsu Naka, Yashio, Japan, assignor to Kabushiki Kaisha Naka Gijutsu Kenkyusho, Sapporo, Japan
Filed Jan. 4, 1982, Ser. No. 336,589
Term of patent 14 years
U.S. Cl. D25—48

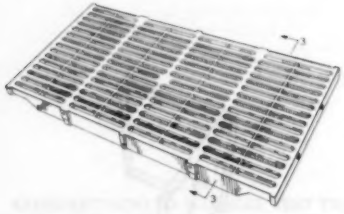


273,996
LADDER-MOUNTED UTILITY SHELF
Raymond E. Rasler, E. College Ave., R.R. #2, Greenville, Ill. 62246
Filed Jun. 14, 1982, Ser. No. 387,805
Term of patent 14 years
U.S. Cl. D25—68

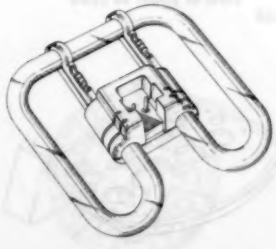
273,997
FLOOR DECK
Thomas G. Ryan, Bethel Park, Pa., assignor to Cyclops Corporation, Pittsburgh, Pa.
Filed Mar. 23, 1982, Ser. No. 361,094
Term of patent 14 years
U.S. Cl. D25—75



273,998
FLOORING UNIT
Robert K. Ballantine, Mullaloo Perth, Australia, assignor to BCM Manufacturing Ltd., Calgary, Canada
Filed Feb. 12, 1982, Ser. No. 348,392
Claims priority, application Canada, Aug. 20, 1981, 2008819
Term of patent 14 years
U.S. Cl. D25—91

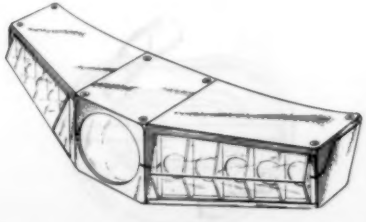


273,999
FLUORESCENT LAMP
John M. Chapman, Bexley, and Basil Antonis, London, both of England, assignors to Thorn EMI Limited, London, England
Filed Aug. 4, 1981, Ser. No. 290,011
Claims priority, application United Kingdom, Feb. 6, 1981, 998795
Term of patent 14 years
U.S. Cl. D26—3



274,000
HEADLIGHT
Francois Bailly, Neuilly sur Seine, France, assignor to Equipements Automobiles Marchal S.A., Issy-les-Moulineaux, France
Filed Oct. 22, 1982, Ser. No. 436,530
Term of patent 14 years
U.S. Cl. D26—29

274,001
VEHICLE EMERGENCY LIGHT
Thomas L. Sailers, P.O. Box 414, Belmont, CA 94002
Filed Aug. 16, 1979, Ser. No. 67,177
Term of patent 14 years
U.S. Cl. D26—35



274,002

COMBINED LAMP AND TORCH

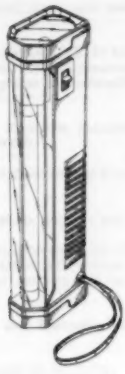
Tit-Wing Poon, 12F Lam Uk Village, Chaiwan, Hong Kong

Filed Sep. 11, 1981, Ser. No. 301,357

Claims priority, application United Kingdom, Apr. 27, 1981, 1000157

Term of patent 14 years

U.S. Cl. D26—42



274,003

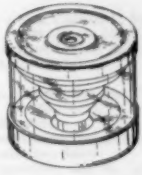
INDIRECT LIGHTING FIXTURE

Dennis E. Johnson, Grafton, Wis., assignor to McGraw-Edison, Rolling Meadows, Ill.

Filed Jan. 15, 1982, Ser. No. 339,834

Term of patent 14 years

U.S. Cl. D26—85



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 22ND DAY OF MAY, 1984

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. Ahlstrom Osakeyhtio: *See*—
Makela, Olavi; Suntio, Ossi; and Tuomaala, Jorma, 4,449,557, Cl. 144-357.000.

A/S Raufoss Ammunisjonsfabrikker: *See*—
Foss, Morten; and Strandli, Kaare R., 4,449,456, Cl. 102-240.000.

Aasen, Steven M.: *See*—
Holmes, Brian N.; Dalzell, Rex J.; and Aasen, Steven M., 4,450,227, Cl. 430-339.000.

AB Bahco Verktyg: *See*—
Brunosson, Bengt B., 4,449,431, Cl. 81-165.000.

Abdo, Milton K., to Mobil Oil Corporation. Oil recovery process employing a non-ionic glucan in combination with clay flocculant. 4,450,084, Cl. 252-8.55D.

Abe, Masahiro: *See*—
Ito, Nobuo; Takeuchi, Koji; Abe, Masahiro; and Ishiguro, Tsuneo, 4,450,267, Cl. 528-99.000.

Abe, Susumu: *See*—
Uyehara, Norioki; Abe, Susumu; and Kimura, Yasuhiro, 4,450,006, Cl. 75-125.000.

Abe, Takeshi: *See*—
Itaba, Takeshi; Matsumoto, Shotaro; and Abe, Takeshi, 4,450,205, Cl. 428-552.000.

Abendroth, Carl W. Flooring system. 4,449,342, Cl. 52-393.000.

Aberg, Seard, to Groko Maskin AB. Method of bending shaped metal sheet and apparatus for carrying out the method. 4,449,388, Cl. 72-381.000.

Abet Group, The: *See*—
Beckman, John B.; and Blickstein, Martin J., 4,449,893, Cl. 417-322.000.

Abex Corporation: *See*—
Viles, Alan H., 4,449,445, Cl. 92-12.200.

Abler, William L. Celestial navigator. 4,449,817, Cl. 356-145.000.

Abraham, Bruce C.; Fegley, Charles R.; and Hurst, Jerry C., to AT&T Technologies, Inc. Assembling components such as lids to chip enclosures. 4,449,282, Cl. 29-467.000.

Abreu, Cristian O., to Xerox Corporation. Electrostatic detack apparatus and method. 4,449,808, Cl. 355-3.0TR.

Accuray Corporation: *See*—
Williams, Paul, 4,449,398, Cl. 73-159.000.
Williams, Paul; and Landis, Dan R., 4,450,404, Cl. 324-226.000.

Achar, Bappalige N.; Fohlen, George M.; and Parker, John A., to United States of America, National Aeronautics and Space Administration. Metal phthalocyanine polymers. 4,450,268, Cl. 528-327.000.

Acker, Clarence R.: *See*—
Sadler, Fred S.; Hettwer, Paul F.; Viet, Vu H.; and Acker, Clarence R., 4,450,424, Cl. 336-94.000.

Ackermann, Remo; and Ackermann, Walter. Water-closet with rotary double pan. 4,449,258, Cl. 4-300.000.

Ackermann, Rudolf, to Siemens Aktiengesellschaft. Digital real-time video image processing device. 4,450,482, Cl. 358-160.000.

Ackermann, Walter: *See*—
Ackermann, Remo; and Ackermann, Walter, 4,449,258, Cl. 4-300.000.

Acrison, Incorporated: *See*—
Ricciardi, Ronald J.; and Rudolph, Otto J., 4,449,597, Cl. 177-256.000.

Adair, Noel J.; Carlisle, Robert W.; Stubbs, Michael E.; and Rooney, John J., to Gallaher Limited. Supported catalysts and method for their production. 4,450,245, Cl. 502-211.000.

Adams, Frederick J., to Cam Gears Limited. Power-assisted steering gear assembly. 4,449,601, Cl. 180-148.000.

Adkins, James: *See*—
McAfee, Richard C.; Adkins, James; and Miskowski, Richard L., 4,450,283, Cl. 556-479.000.

Agano, Toshitaka: *See*—
Oshikoshi, Yuji; and Agano, Toshitaka, 4,450,485, Cl. 358-298.000.

Agency of Industrial Science and Technology: *See*—
Tani, Tatsuo; Sawata, Sinji; Tanaka, Tadayoshi; Sakuta, Koichi; Nakamoto, Yasunobu; Sekiya, Hideshi; Morita, Masanobu; and Yamagata, Norio, 4,449,517, Cl. 126-435.000.

Agfa-Gevaert Aktiengesellschaft: *See*—
Geyken, Erwin; Koninger, Horst; and Schirk, Gunter, 4,449,278, Cl. 29-132.000.
Steinsberger, Karl; Maier, Albert; and Herrmann, Walter, 4,449,868, Cl. 408-138.000.
Weyde, Edith; von Rintelen, Harald; Saleck, Wilhelm; and Teitscheid, Heinz-Horst, 4,450,225, Cl. 430-567.000.

AGFA-Gevaert, N.V.: *See*—
Van Poucke, Raphael K.; Van de Sande, Christian C.; and Verhecken, Andree , 4,450,223, Cl. 430-223.000.

AHI Operations Limited: *See*—
Millar, Thomas D.; and Miller, David M., 4,449,980, Cl. 604-890.000.

Ahn, Min H. Telescopic tanker for carrying fluid. 4,449,724, Cl. 280-5.00C.

Ahola, Clifford J.: *See*—
Tloczynski, James J.; Ahola, Clifford J.; Rosenstein, Nicholas D.; and Rine, James C., 4,449,670, Cl. 241-35.000.
Tloczynski, James J.; Budzol, Melvin; Ahola, Clifford J.; and Rine, James C., 4,449,674, Cl. 241-245.000.

Aihara, Kenichi: *See*—
Araki, Kazuhiko; Ao, Hideki; Kimura, Tomohiko; and Aihara, Kenichi, 4,450,165, Cl. 424-258.000.

Aioi Seiki Kabushiki Kaisha: *See*—
Yonezawa, Keitaro; and Utsumi, Tadao, 4,449,907, Cl. 425-183.000.

Air Products and Chemicals, Inc.: *See*—
Berger, Kerry R.; Kaspersma, Jelle H.; Luybli, Joseph R.; Millward, Barry; and Shay, Robert H., 4,450,017, Cl. 148-16.000.
Eskinazi, Victoria, 4,450,306, Cl. 568-630.000.
Hegarty, William P.; and Schmidt, William P., 4,449,994, Cl. 62-17.000.
Iacoviello, John G., 4,449,978, Cl. 604-372.000.

Aisan Industry Co., Ltd.: *See*—
Nakamura, Norihiko; Ito, Takaaki; Katou, Takashi; Ota, Yozo; and Morino, Toshiharu, 4,450,117, Cl. 261-39.00A.

Aisan Kogyo Kabushiki Kaisha: *See*—
Ito, Shoji, 4,449,499, Cl. 123-339.000.

Aisin Seiki Kabushiki Kaisha: *See*—
Ishii, Masami; Sugimoto, Hitoshi; Takeda, Shinji; and Shibata, Susumu, 4,450,038, Cl. 156-497.000.

Ajinomoto Company Incorporated: *See*—
Ito, Nobuo; Takeuchi, Koji; Abe, Masahiro; and Ishiguro, Tsuneo, 4,450,267, Cl. 528-99.000.

Akai, Tsugio: *See*—
Donomoto, Tadashi; Tanaka, Atsuo; Tatematsu, Yoshiaki; and Akai, Tsugio, 4,450,207, Cl. 428-614.000.

Akashi, Goro: *See*—
Tadokoro, Eiichi; Fujiyama, Masaaki; and Akashi, Goro, 4,450,199, Cl. 428-317.900.

Akebono Brake Industry Company, Ltd.: *See*—
Yanagi, Kouichiro, 4,449,447, Cl. 92-248.000.

Akita, Shinji; Hatanaka, Masayuki; and Uemura, Akira, to Nippon Kokan Kabushiki Kaisha. Steel pipe rolling mill. 4,449,386, Cl. 72-100.000.

Akiyama, Nobuyuki: *See*—
Yamaguchi, Kazuo; Kuni, Asahiro; Akiyama, Nobuyuki; and Endo, Juro, 4,449,818, Cl. 356-237.000.

Akiyoshi, Yuji: *See*—
Kamioka, Toshiharu; Nakayama, Isao; Honda, Takeo; Kobayashi, Takashi; Obata, Tokio; Fujii, Katsutoshi; Kojima, Mikio; and Akiyoshi, Yuji, 4,450,162, Cl. 424-251.000.

Aklufi, Monti E., to United States of America, Navy. Chemical etching of transformed structures. 4,450,041, Cl. 156-628.000.

Albanese, Victor J.; and Schmidt, Charles J., to Grumman Aerospace Corporation. Apparatus and method for improving antenna sidelobe cancellation. 4,450,448, Cl. 343-379.000.

Aldrich, Deborah G.: *See*—
Vink, Walter V.; and Aldrich, Deborah G., 4,450,179, Cl. 426-103.000.

Alexander, Alfred, Jr., to Robertson Factories, Inc. Device to install drapery hooks. 4,449,295, Cl. 29-798.000.

Alexander, John H., to ITT Industries, Inc. Multilayer ceramic dielectric capacitors. 4,450,502, Cl. 361-309.000.

Alexander, William H.; and Dare, Roy R., to Vapor Corporaion. Fire safe plug valve. 4,449,695, Cl. 251-214.000.

Alfven, Hannes; Herlofson, Nicolai; Babic, Miroslav; and Brunberg, Ernst-Ake. Method of storing energy and system for carrying out this method. 4,449,577, Cl. 165-104.120.

Allegheny Ludlum Steel Corporation: *See*—
Ames, S. Leslie; Gray, Thomas H.; and Kish, Lewis L., 4,450,206, Cl. 428-606.000.
Hunt, Joseph M., 4,450,208, Cl. 428-620.000.
Lovejoy, Paul T., 4,450,058, Cl. 204-145.00R.

Allied Corporation: *See*—
Narasimham, Mandayam C., 4,449,568, Cl. 164-453.000.
Sparks, Ronald L., 4,449,594, Cl. 175-59.000.

Allis-Chalmers Corporation: *See*—
Hancock, Peter D., 4,449,365, Cl. 60-422.000.

Alps Electric Co., Ltd.: *See*—
Kano, Mitsuru; and Kamijyo, Yoshimi, 4,450,100, Cl. 252-518.000.
Kobayashi, Mikio; and Kuritani, Kingo, 4,449,769, Cl. 339-17.00C.

Alsthom-Atlantique: *See*—
Combes, Gilles; and Delage, Germain, 4,449,851, Cl. 405-93.000.
Aluminum Company of America: *See*—
Ramser, Robert A., 4,449,902, Cl. 425-7.000.
Rolf, Richard L., 4,450,061, Cl. 204-286.000.
ALZA Corporation: *See*—
Cortese, Richard; Barclay, Brian; and Theeuwes, Felix, 4,449,983, Cl. 604-892.000.
Michaels, Alan S., 4,450,198, Cl. 428-315.500.
Amana Refrigeration, Inc.: *See*—
Hays, Herbert G.; and Kuipers, Warren W., 4,449,511, Cl. 126-110.00R.
Amax Inc.: *See*—
Laferty, John M.; Queneau, Paul B.; and Beckstead, Leo W., 4,450,144, Cl. 423-54.000.
American Cyanamid Company: *See*—
Du, Mila T.; and Shepherd, Robert G., 4,450,272, Cl. 544-357.000.
Kamhi, Victor M., 4,450,305, Cl. 568-611.000.
American Hospital Supply Corporation: *See*—
Erhardt, Paul W.; and Borgman, Robert J., 4,450,173, Cl. 424-309.000.
American Microsystems, Incorporated: *See*—
Batra, Tarsaim L.; and Bowden, Scott, 4,450,021, Cl. 29-571.000.
American Optical Corporation: *See*—
Davignon, Paul A., 4,449,477, Cl. 118-694.000.
Ames, S. Leslie; Gray, Thomas H.; and Kish, Lewis L., to Allegheny Ludlum Steel Corporation. Amorphous metals and articles made thereof. 4,450,206, Cl. 428-606.000.
AMFIT, Inc.: *See*—
Schwartz, Vern R., 4,449,264, Cl. 12-1.00R.
Amos, Homer C.: *See*—
Benedyk, Joseph C.; Amos, Homer C.; Scheie, Carl E.; and McGlone, William R., 4,449,712, Cl. 273-326.000.
AMP Incorporated: *See*—
Esser, Wilhelm C. J.; and van den Nosterum, Adrianus, 4,449,773, Cl. 339-59.00M.
Fukukura, Kazutoyo; and Martinez, Richard A., 4,450,324, Cl. 200-5.00A.
Fukukura, Kazutoyo, 4,450,331, Cl. 200-160.000.
Grabbe, Dimitry G.; and Korsunsky, Iosif, 4,449,770, Cl. 339-17.0CF.
Kampfmann, Georg, 4,449,883, Cl. 414-744.00A.
Lane, David, 4,449,778, Cl. 339-143.00R.
Weidler, Charles H., 4,449,767, Cl. 339-17.0LC.
Ampafrance S.A.: *See*—
Surot, Patrick, 4,449,732, Cl. 280-644.000.
Anderson, David J.; and Loughman, Barbara E., to Upjohn Company, The. Carbamic acid derivatives as selective immunosuppresive agents. 4,450,159, Cl. 424-246.000.
Anderson, David L.; Hitchcock, Robert F.; and Tamburrino, Robert M., to Sealed Power Corporation. Transmission fluid filter and method of manufacture. 4,450,081, Cl. 210-445.000.
Anderson, Erik T.: *See*—
Vesterlund, Gunnar; and Anderson, Erik T., 4,450,016, Cl. 148-11.50F.
Anderson, Robert R.: *See*—
Morlock, Ruben D.; Kopecky, Ivyl D.; Anderson, Robert R.; and Marcy, Dewey R., 4,449,672, Cl. 241-101.700.
Anderson, Scott, to APL Anderson, Inc. Method of introducing sodium amalgam into lamps and lamp containing sodium amalgam particles. 4,449,948, Cl. 445-18.000.
Andersson, Arne: *See*—
Lini, Edward L.; Melleby, Juul A.; and Andersson, Arne, 4,449,569, Cl. 165-1.000.
Ando, Hideo; Nakagawa, Toshiharu; and Fujimori, Yoshinori, to Tokyo Shibaura Denki Kabushiki Kaisha. Data recording medium. 4,450,452, Cl. 346-135.100.
Ando, Takao: *See*—
Yoshikumi, Chikao; Ohmura, Yoshio; Hirose, Fumio; Ikuzawa, Masanori; Matsunaga, Kenichi; Fujii, Takayoshi; Ohhara, Minoru; and Ando, Takao, 4,450,156, Cl. 424-180.000.
Andre, Jean-Louis: *See*—
Lerouge, Andre; Andre, Jean-Louis; and Coutin, Pierre, 4,449,920, Cl. 431-91.000.
Andrei-Alexandru, Marcel; and Prohaska, Hans, to ITT Industries, Inc. Window lifter and door locking system. 4,450,390, Cl. 318-282.000.
Andreini, Rockne J.; Farmer, Audley J.; and Yaguchi, Svetlana, to Earle M. Jorgensen Co. Stainless steel. 4,450,008, Cl. 75-128.00A.
Andrejco, Matthew J.; Paek, Un C.; and Schroeder, Charles M., Jr., to AT&T Technologies, Inc. Zirconia induction furnace. 4,450,333, Cl. 219-10.49R.
Angevine, Philip J.; Carroll, Michael B.; Shih, Stuart S.; and Tabak, Samuel A., to Mobil Oil Corporation. Distillation-induced extraction process. 4,450,067, Cl. 208-86.000.
Annaka, Masao: *See*—
Kitawaki, Michio; and Annaka, Masao, 4,449,717, Cl. 277-153.000.
Anthony, William S., to United States of America, Agriculture. Method for separating closed bolls of cotton by maturity. 4,449,391, Cl. 73-32.00R.
Antivols Simplex: *See*—
Thirion, Andre; Sorba, Antoine; Dany, Jean-Claude; Pacaud, Andre; and Attal, Gerard, 4,449,385, Cl. 70-277.000.
Antonazzi, Frank J., to Bendix Corporation, The. Pressure measurement system with a constant settlement time. 4,449,409, Cl. 73-724.000.
Ao, Hideki: *See*—
Araki, Kazuhiko; Ao, Hideki; Kimura, Tomohiko; and Aihara, Kenichi, 4,450,165, Cl. 424-258.000.
Aoki, Keiji: *See*—
Yaegashi, Takehisa; Aoki, Keiji; and Hashikawa, Kenzo, 4,450,528, Cl. 364-431.050.
Aoki, Takeo: *See*—
Matsuo, Tohru; and Aoki, Takeo, 4,450,004, Cl. 75-53.000.
Aoyagi, Edward I., to Chevron Research Company. Intermediates for 1-methyl-3,4-dihalo-5-thio-(2-hydroxyethyl)-pyrazole. 4,450,278, Cl. 548-376.000.
Apitz, Siegfried; and Nonnenmann, Rolf, to International Standard Electric Corporation. Bar code with optical reading device. 4,450,349, Cl. 235-462.000.
APL Anderson, Inc.: *See*—
Anderson, Scott, 4,449,948, Cl. 445-18.000.
Aplin, George E.: *See*—
McCarthy, Cornelius J.; and Aplin, George E., 4,449,330, Cl. 51-241.00S.
Appels, Johannes A.: *See*—
Maas, Henricus G. R.; and Appels, Johannes A., 4,449,287, Cl. 29-580.000.
Appleton Papers Inc.: *See*—
Schulz, William J., 4,450,043, Cl. 162-5.000.
Araghi, Mehdi N.; and Daniele, Joseph J., to Xerox Corporation. Multi-function reproduction apparatus. 4,450,458, Cl. 346-155.000.
Arai, Kenichiro, to Epson Corporation; and Kabushiki Kaisha Suwa Seikosha. Printing device. 4,449,835, Cl. 400-161.000.
Arai, Mitsuru: *See*—
Sato, Hideyori; and Arai, Mitsuru, 4,449,366, Cl. 60-444.000.
Arai, Norikazu; Ishiyama, Shozo; and Kojima, Tadashi, to Konishiroku Photo Industry Co., Ltd. Large-aperture single lens with aspherical surfaces. 4,449,792, Cl. 350-432.000.
Araki, Kazuhiko; Ao, Hideki; Kimura, Tomohiko; and Aihara, Kenichi, to Yoshitomi Pharmaceutical Industries, Ltd. Dihydropyridine compounds. 4,450,165, Cl. 424-258.000.
Arbed S.A.: *See*—
Erpelding, Jean, 4,449,700, Cl. 266-79.000.
Archambault, Marcel, to Chapel Reprographie. Machine for folding large-size drawings or documents. 4,449,963, Cl. 493-414.000.
Arcilesi, Donald A., to OMI International Corporation. Ammonium ions used as electroless copper plating rate controller. 4,450,191, Cl. 427-443.100.
Arieh, Simon: *See*—
Courvoisier, Guy; and Arieh, Simon, 4,450,347, Cl. 219-549.000.
Arimoto, Satomi; Yamaji, Shigeru; and Ishitobi, Chikato, to Mitsubishi Denki Kabushiki Kaisha. Gas circuit breaker. 4,450,329, Cl. 200-148.00A.
Arimura, Katsuo; Murakami, Shu; and Oka, Taichi, to Yoshitomi Pharmaceutical Industries, Ltd. Cyclic iminocarboxylic acid derivatives. 4,450,275, Cl. 548-201.000.
ARMCO Inc.: *See*—
Lawson, John E., 4,449,583, Cl. 166-72.000.
Armstrong World Industries, Inc.: *See*—
Kauffman, William J.; and Wright, Ralph W., 4,450,194, Cl. 428-172.000.
Arter, William L.; and Russell, Byron L. Apparatus and method for providing a smooth edge on sheared metal. 4,450,015, Cl. 148-9.00R.
Arthur D. Little, Inc.: *See*—
Sidman, Kenneth R., 4,450,150, Cl. 424-1.100.
Asahi Kasei Kogyo Kabushiki Kaisha: *See*—
Mimura, Akio; Yuasa, Katsumi; and Shibukawa, Mitsuru, 4,450,233, Cl. 435-178.000.
Tanouchi, Masatoshi; and Asahina, Yoshiyuki, 4,450,082, Cl. 210-660.000.
Asahina, Hiroshi: *See*—
Sato, Hideki; and Asahina, Hiroshi, 4,450,577, Cl. 378-109.000.
Asahina, Yoshiyuki: *See*—
Tanouchi, Masatoshi; and Asahina, Yoshiyuki, 4,450,082, Cl. 210-660.000.
Ashizawa, Takeshi; and Yasumura, Motoaki, to Kabushiki Kaisha Tanaka Seisakusho. Method of controlling an operation of a copy-cutting apparatus. 4,449,699, Cl. 266-58.000.
Ashland Oil, Inc.: *See*—
Hettinger, William P., Jr.; Kovach, Stephen M.; and Hoffman, James F., 4,450,241, Cl. 502-34.000.
Mansour, Maher L., 4,449,828, Cl. 366-147.000.
Askew, Herbert F.; Harrington, Colin J.; and Bridgwater, Terry J. P. Vapor lock resistant hydraulic fluids. 4,450,087, Cl. 252-73.000.
Asmus, John F., to Maxwell Laboratories, Inc. Pumping a photolytic laser utilizing a plasma pinch. 4,450,568, Cl. 372-76.000.
Associated Electrical Industries Limited: *See*—
Markham, John D., 4,450,388, Cl. 318-87.000.
AT&T Technologies, Inc.: *See*—
Abraham, Bruce C.; Fegley, Charles R.; and Hurst, Jerry C., 4,449,282, Cl. 29-467.000.
Andrejco, Matthew J.; Paek, Un C.; and Schroeder, Charles M., Jr., 4,450,333, Cl. 219-10.49R.
Atlantic Richfield Company: *See*—
Sofranko, John A.; and Leonard, John J., 4,450,293, Cl. 562-579.000.
Stern, Michael J., 4,450,034, Cl. 156-382.000.
Atsuta, Toshio: *See*—
Yoshida, Toshio; Matsui, Shigetomo; and Atsuta, Toshio, 4,449,281, Cl. 29-421.00R.

Attal, Gerard: *See*—
Thirion, Andre; Sorba, Antoine; Dany, Jean-Claude; Pacaud, Andre; and Attal, Gerard, 4,449,385, Cl. 70-277.000.

Austen, Alfred R.; and Humphries, Darral V., to Bethlehem Steel Corporation. Apparatus for the hydrostatic extrusion of thermoplastic polymers. 4,449,904, Cl. 425-97.000.

Auth, David C.; Lawrence, Dale M.; and Majoch, Tim R., to University of Washington. Fast pulse thermal cautery probe and method. 4,449,528, Cl. 128-303.100.

Aviation Electric Ltd.: *See*—
Evans, Rowland M., 4,449,360, Cl. 60-39.281.

Avon Products, Inc.: *See*—
Lindauer, Jerome I., 4,449,987, Cl. 44-7.500.

Awano, Toshimi: *See*—
Hayashi, Keijiro; Awano, Toshimi; Yoshikawa, Masayuki; Yazawa, Kouzou; and Ito, Takashi, 4,449,707, Cl. 273-171.000.

Azuma, Shizuo: *See*—
Yamada, Takeyoshi; Kurisu, Shizuka; Azuma, Shizuo; Kawase, Shoji; and Sano, Makoto, 4,449,992, Cl. 55-158.000.

Baba, Katsuyoshi: *See*—
Saito, Chuichi; Teranishi, Katsuya; Baba, Katsuyoshi; and Osumi, Yoshihiro, 4,449,623, Cl. 198-335.000.

Baba, Masanao, to Nippon Cable System Inc. Steering apparatus. 4,449,420, Cl. 74-501.00R.

Babcock Power Limited: *See*—
Hamill, Anthony C.; and Hawkins, Ronald J., 4,449,387, Cl. 72-215.000.

Babcock & Wilcox Company, The: *See*—
Russell, Thomas D.; and Walker, Robert R., 4,450,363, Cl. 290-40.00C.

Babic, Miroslav: *See*—
Alfven, Hannes; Herlofson, Nicolai; Babic, Miroslav; and Brunberg, Ernst-Ake, 4,449,577, Cl. 165-104.120.

Bachman, G. Merle: *See*—
Davis, Charles L.; and Bachman, G. Merle, 4,449,761, Cl. 312-116.000.

Backes, Reiner: *See*—
Schmidtpott, Friedrich; and Backes, Reiner, 4,450,432, Cl. 340-146.200.

Backman, Bo G. Apparatus and method for drawing curves. 4,449,301, Cl. 33-32.00E.

Bader, Horst, to Eckardt AG. Controller with adjustable proportionality range. 4,449,546, Cl. 137-86.000.

Bader, Nicholas F., III: *See*—
Longo, Frank N.; Bader, Nicholas F., III; and Dorfman, Mitchell R., 4,450,184, Cl. 427-34.000.

Baggio, Giorgio, to Nordica S.p.A. Hydraulic device particularly for ski boot fastening. 4,449,273, Cl. 24-68.0SK.

Baillie, David H.: *See*—
Brodribb, Marcus T.; Brodribb, Anthony G.; and Baillie, David H., 4,449,317, Cl. 43-15.000.

Baitis, A. Erich: *See*—
Woolaver, Dennis A.; and Baitis, A. Erich, 4,449,469, Cl. 114-150.000.

Baker, Kenneth R.; and De Vault, Robert T., to Maritec Corporation. Variable inlet hydrojet boat drive. 4,449,944, Cl. 440-47.000.

Balbinot, Renzo, to Nordica S.p.A. Device for controlling the fitting-on of ski boots and the like. 4,449,274, Cl. 24-70.0SK.

Baldwin Piano & Organ Company: *See*—
Cotton, Robert B., Jr.; and Uetrecht, Dale M., 4,449,437, Cl. 84-1.010.

Balitch, Paul, to Caterpiller Tractor Co. Track chain link and forging process for the manufacture of track chain links. 4,449,357, Cl. 59-30.000.

Balje, Otto E. Free spool inducer pump. 4,449,888, Cl. 415-143.000.

Ballast-Nedam Groep N.V.: *See*—
Wolters, Tjako A.; and Roggekamp, Aloysius G., 4,449,720, Cl. 277-207.00A.

Balzers Aktiengesellschaft: *See*—
Kraus, Thaddaus, 4,449,478, Cl. 118-720.000.
Thoni, Werner, 4,449,790, Cl. 350-357.000.

Banach, Terrance R.: *See*—
Brooks, Robert A.; Banach, Terrance R.; Barman, Erik; and Livia, Michael R., 4,449,408, Cl. 73-643.000.
Suhr, Peter J.; Brooks, Robert A.; and Banach, Terrance R., 4,449,411, Cl. 73-643.000.

Baney, Ronald H., to Dow Corning Corporation. Alumina-containing organosilicon resins. 4,450,255, Cl. 524-430.000.

Bar, Alfredo, to Necchi Societa per Azioni. Muffler for compressor for refrigerating apparatuses. 4,449,610, Cl. 181-243.000.

Barber, Leonard B., Jr.: *See*—
Taylor, James C.; and Barber, Leonard B., Jr., 4,449,927, Cl. 433-38.000.

Barclay, Brian: *See*—
Cortese, Richard; Barclay, Brian; and Theeuwes, Felix, 4,449,983, Cl. 604-892.000.

Baribeau, Gary A., to Minnesota Mining and Manufacturing Company. Drop wire connector. 4,449,777, Cl. 339-103.00R.

Barishpolsky, Boris M.; and Filstein, Eugene L. Lane change guidance system. 4,450,430, Cl. 340-904.000.

Barman, Erik: *See*—
Brooks, Robert A.; Banach, Terrance R.; Barman, Erik; and Livia, Michael R., 4,449,408, Cl. 73-643.000.

Barnes-Hind/Hydrocurve, Inc.: *See*—
Koeniger, Erich A., 4,449,257, Cl. 3-13.000.

Barnett, Loren A. Protective cover for keyboard machines. 4,449,763, Cl. 312-208.000.

Barny, Jean-Jacques; and Capdeboscq, Bernard, to S.A. Martin. Retractable propulsion apparatus for cardboard box printing machine. 4,449,450, Cl. 101-232.000.

Baron, Michel; and Larrat, Philippe, to Societe d'Utilisation Scientifique et Industrielle du Froid Usifroid. Freeze-drying apparatus. 4,449,305, Cl. 34-92.000.

Barrieau, Paul B., to Stanley Works, The. Display and storage container for multiple tool parts and the like. 4,449,629, Cl. 206-45.190.

Barry, James D.; and Denney, Joseph M., to Hughes Aircraft Company. Floating disc photoconductive film reader. 4,450,489, Cl. 358-348.000.

Bartelmuss, Heinrich. Connecting arrangement for support members cooperating with a liquid permeable web. 4,449,565, Cl. 162-352.000.

Barth, Gerald D., to Illinois Tool Works Inc. Fastener for attaching articles to a penetrable surface. 4,449,873, Cl. 411-341.000.

Bartlett, Allen J.: *See*—
Peterson, John F.; and Bartlett, Allen J., 4,449,373, Cl. 62-55.500.

Bartoszek-Loza, Rosemary: *See*—
Eskamani, Abolghassem; Dernar, Helen D.; and Bartoszek-Loza, Rosemary, 4,450,059, Cl. 204-158.00R.

Barzantny, Joachim; Beske, Joachim; Hans, Rainer; and Lauhoff, Theodor, to Siemens Interatom, Intl. Atomreaktorbau GmbH. Device for controlling a liquid metal flow in a tube. 4,449,890, Cl. 417-50.000.

BASF Aktiengesellschaft: *See*—
Graf, Fritz; and Hupfer, Leopold, 4,450,277, Cl. 548-346.000.
Graser, Fritz, 4,450,273, Cl. 546-37.000.
Hertel, Otto; Linhart, Friedrich; and Scharf, Emil, 4,450,045, Cl. 162-164.300.
Hirsch, Guenter; and Ley, Gregor, 4,450,013, Cl. 106-308.00N.
Schmidts, Kurt; Schuett, Walter; Zeysolff, Edmond; and Saumer, Wilhelm, 4,449,914, Cl. 425-556.000.
Streit, Werner; Lorenz, Klaus; and Leppert, Norbert, 4,450,083, Cl. 252-8.600.

BASF Wyandotte Corporation: *See*—
Kaneko, Thomas M.; Dutton, Daniel R.; and Kim, Bongsub, 4,450,001, Cl. 71-118.000.
Schmolka, Irving R., 4,450,091, Cl. 252-174.210.
Wilson, Joe C.; and Hirozawa, Stanley T., 4,450,088, Cl. 252-75.000.

Basic Machinery Co., Inc.: *See*—
Kenworthy, Samuel P., 4,449,909, Cl. 425-296.000.

Baskwell, John A.; and Larrive, Christopher, to Pirelli General Public Limited Company. High voltage, gas-filled electric cable with spacers between conductor and sheath. 4,450,317, Cl. 174-27.000.

Basov, Emma; and Grois, Igor, to TRW Inc. Hybrid optical/electrical connector. 4,449,784, Cl. 350-96.210.

Batra, Tarsaim L.; and Bowden, Scott, to American Microsystems, Incorporated. Mask diffusion process for forming Zener diode or complementary field effect transistors. 4,450,021, Cl. 29-571.000.

Battelle Memorial Institute: *See*—
Courvoisier, Guy; and Arieh, Simon, 4,450,347, Cl. 219-549.000.

Bauer, Helmut: *See*—
Krob, Erwin; and Bauer, Helmut, 4,449,729, Cl. 280-605.000.

Bauer, Kurt: *See*—
Morawietz, Hans-Joachim; Hoffman, Erich; Hanauer, Johann; and Bauer, Kurt, 4,450,116, Cl. 260-502.50E.

Baum, Marcel, to Dragerwerk A.G. Positioning device for use with a tracheal tube which is insertable into a person's trachea for respiration purposes. 4,449,522, Cl. 128-200.260.

Baum, Walter; Still, Michael; and Becker, Erich, to Kabel- und Metallwerke. Heat-producing elements with heat pipes. 4,449,576, Cl. 165-104.330.

Baxter Travenol Laboratories, Inc.: *See*—
Kamen, Dean L., 4,449,976, Cl. 604-254.000.

Bayer Aktiengesellschaft: *See*—
Forster, Heinz; and Priesnitz, Uwe, 4,450,308, Cl. 568-637.000.
Idel, Karsten; Freitag, Dieter; and Merten, Josef, 4,450,266, Cl. 524-265.000.
Messer, Dieter; Wilhelm, Volker; Endres, Robert; and Heine, Heinrich, 4,450,012, Cl. 106-300.000.
Preiss, Michael; Gau, Wolfgang; and Behre, Horst, 4,450,297, Cl. 568-424.000.
Schmidt, Manfred; Wank, Joachim; Reese, Eckart; Freitag, Dieter; Wangermann, Klaus; and Cohnen, Wolfgang, 4,450,249, Cl. 524-132.000.

Bayer, Peter. Process for the preparation of dentures. 4,449,936, Cl. 433-214.000.

Bays, David E.; and Hayes, Roger, to Glaxo Group Limited. Pharmaceutical compositions containing compounds having action on histamine receptors. 4,450,168, Cl. 424-267.000.

Beath, Robert W.; and McDonald, John R., to McDonald Elevator. Hydraulic ram safety device with circular brake. 4,449,615, Cl. 188-67.000.

Beauchamp, Gerson E.: *See*—
Ragas, Frank J.; Minnis, Ralph L.; and Beauchamp, Gerson E., 4,450,203, Cl. 428-514.000.

Beaudoin, Normand, to Compagnie du Moteur Energitique C.M.E. Inc. Internal combustion engine. 4,449,494, Cl. 123-52.00A.

Beck, Ernst; Lenard, Peter; and Pokorny, Erich, to Vollmer Werke Maschinenfabrik GmbH. Machine for machining circular saw blades. 4,449,427, Cl. 76-77.000.

Beck, Jeffrey L., to Conoco Inc. Vortex injection method and apparatus. 4,449,862, Cl. 406-93.000.

Beck, Martin H.: *See*—
Krishnakumar, Suppayan M.; Harry, Leuan L.; and Beck, Martin H., 4,449,913, Cl. 425-548.000.

Becker Autoradiowerk GmbH: *See*—
Rohrich, Manfred; and Brinkhaus, Stefan, 4,450,588, Cl. 455-192.000.

Becker, Erich: *See*—
Baum, Walter; Still, Michael; and Becker, Erich, 4,449,576, Cl. 165-104.330.

Becker, Kunibert; Elsner, Burckhard; and Kirchbrucher, Rudiger, to Gewerkschaft Eisenhutte Westfalia. Mine roof supports. 4,449,860, Cl. 405-293.000.

Beckman Instruments, Inc.: *See*—
Harman, John N., III, 4,450,064, Cl. 204-412.000.
Piramoon, Alireza, 4,449,966, Cl. 494-20.000.
Strain, David H., 4,449,965, Cl. 494-16.000.

Beckman, John B.; and Blickstein, Martin J., to Abet Group, The. Apparatus and method for piezoelectric pumping. 4,449,893, Cl. 417-322.000.

Beckstead, Leo W.: *See*—
Laferty, John M.; Queneau, Paul B.; and Beckstead, Leo W., 4,450,144, Cl. 423-54.000.

Becton Dickinson and Company: *See*—
Burns, James A.; and Nugent, Edward L., 4,449,529, Cl. 128-314.000.

Beecham Group Limited: *See*—
Beeley, Lee J.; and Newsome, Peter M., 4,450,170, Cl. 424-273.00R.

Beeley, Lee J.; and Newsome, Peter M., to Beecham Group Limited. Treatment of diarrhoea with 2-aminoimidazoline derivatives. 4,450,170, Cl. 424-273.00R.

Behmel, Lukas K.; and Zuckert, Bertram, to Vianova Kunstharz, A.G. Process for producing phosphoric acid group containing polyester resins and their use as paint binders. 4,450,257, Cl. 525-437.000.

Behre, Horst: *See*—
Preiss, Michael; Gau, Wolfgang; and Behre, Horst, 4,450,297, Cl. 568-424.000.

Beitel, Howard V.: *See*—
Wohlford, William P.; and Beitel, Howard V., 4,449,758, Cl. 305-12.000.

Bela, Batyi; Geza, Gulyas; Zoltan, Bozso; Istvan, Csakany; and Janos, Bartucz, to Gepgyar, Lang. Process and apparatus, mainly for burning agricultural plant refuse. 4,449,460, Cl. 110-214.000.

Belden, Ralph A. Windmill. 4,449,889, Cl. 416-16.000.

Bell, Howard T., to Ferranti plc. Signal switching and combining systems for diversity radio receiving systems. 4,450,585, Cl. 455-135.000.

Bell Telephone Laboratories, Incorporated: *See*—
Copeland, John A., 4,450,565, Cl. 372-32.000.

Bellay, Jeffrey D.: *See*—
McDonough, Kevin C.; Mayn, John W.; Swoboda, Gary L.; and Bellay, Jeffrey D., 4,450,521, Cl. 364-200.000.

Bendel, Lee P.; and Sardelis, Timothy, to Ethicon, Inc. Hemostatic clips and method of manufacture. 4,449,530, Cl. 128-325.000.

Bendiberica S.A.: *See*—
Soler Bruguera, Raimon, 4,449,419, Cl. 74-493.000.

Bendix Corporation, The: *See*—
Antonazzi, Frank J., 4,449,409, Cl. 73-724.000.
Luscomb, Douglas A., 4,449,503, Cl. 123-447.000.
Mayer, Endre A., 4,449,507, Cl. 123-467.000.

Benedyk, Joseph C.; Amos, Homer C.; Scheie, Carl E.; and McGlone, William R., to Brunswick Corporation. Method of playing a cestaball game with a scoop device. 4,449,712, Cl. 273-326.000.

Benlolo, Leon; and Tolf, Carl O., Jr. Fire extinguisher mounting unit. 4,449,588, Cl. 169-48.000.

Benoit, William R. Lighter than air wind energy conversion system utilizing a rotating envelope. 4,450,364, Cl. 290-55.000.

Benraad, Coenraad J. B. M.: *See*—
Ettema, Ernst; Benraad, Coenraad J. B. M.; and Roskam, Klaas, 4,450,132, Cl. 264-328.800.

Bentley, Arthur P. Pump with rotary sonic pressure wave generator. 4,449,892, Cl. 417-240.000.

Bepko, Stephen J., to Westinghouse Electric Corp. Rapidly turnable laser system. 4,450,563, Cl. 372-23.000.

Bequette, Noah L. Apparatus and method for bridge deck construction. 4,450,121, Cl. 264-31.000.

Berecz, Imre; Schultz, Dennis; and Daniel, Leroy O., to Microdot Inc. Semi-automatic insert tool. 4,449,283, Cl. 29-566.100.

Berg, Bengt O., to Telefonaktiebolaget L M Ericsson. Balanced amplifier output stage. 4,450,412, Cl. 330-255.000.

Berger, Kerry R.; Kaspersma, Jelle H.; Luybli, Joseph R.; Millward, Barry; and Shay, Robert H., to Air Products and Chemicals, Inc. Gaseous decarburizing mixtures of hydrogen, carbon dioxide and a carrier gas. 4,450,017, Cl. 148-16.000.

Berger, Pierre L. Simulator for wind surfing. 4,449,940, Cl. 434-66.000.

Bergeron, Willard, to Equifab, Inc. Filter module for dust collector system. 4,449,993, Cl. 55-379.000.

Berkenblit, Melvin: *See*—
Reisman, Arnold; Berkenblit, Melvin; and Merz, Charles J., III, 4,449,580, Cl. 165-104.340.

Beske, Joachim: *See*—
Barzantny, Joachim; Beske, Joachim; Hans, Rainer; and Lauhoff, Theodor, 4,449,890, Cl. 417-50.000.

Bespak Industries Limited: *See*—
Reed, Norman L.; and Parkin, Trevor D., 4,449,647, Cl. 222-153.000.

Bethlehem Steel Corporation: *See*—
Austen, Alfred R.; and Humphries, Darral V., 4,449,904, Cl. 425-97.000.
Rice, David A.; Greenbaum, Robert R.; and Conarty, Thomas J., Jr., 4,450,046, Cl. 201-20.000.

Betron, Frank A.; Davis, James W.; Kockler, Barry C.; and Spears, Lonnie K., to Mead Corporation, The. Platen cover. 4,449,811, Cl. 355-3.0SH.

Bevan, David R.; and Layman, Jeremy, to Downs Surgical Limited. Venting device for stoma bags. 4,449,970, Cl. 604-333.000.

Bevington, Richard C.: *See*—
Kim, Han J.; and Bevington, Richard C., 4,450,204, Cl. 428-552.000.

Beyers, Billy W., Jr., to RCA Corporation. Tuning arrangement for providing relatively uniform automatic fine tuning sensitivity. 4,450,587, Cl. 455-182.000.

BHS-Dr. Ing. Hofler Maschinenbau GmbH: *See*—
Maier, Kurt, 4,449,869, Cl. 409-11.000.

Bickler, Thomas C.: *See*—
Zebker, Howard A.; Held, Daniel N.; Goldstein, Richard M.; and Bickler, Thomas C., 4,450,447, Cl. 343-17.700.

Bignell, Allan M., to Westinghouse Canada. Ultra-high-speed relay. 4,450,497, Cl. 361-82.000.

Binney & Smith Inc.: *See*—
Underwood, Ronald E., 4,449,304, Cl. 33-437.000.

Bio/Optical Sensor Partners, Ltd.: *See*—
Fraden, Jacob, 4,450,351, Cl. 250-221.000.

Biostar Medical Products, Inc.: *See*—
Ozkan, Adil N., 4,450,231, Cl. 435-7.000.

Biotest-Serum-Institut GmbH: *See*—
Walker, Wolfram H.; Ganshirt, Karl H.; and Schleussner, Hans, 4,450,078, Cl. 210-315.000.

Bird, Gary M.: *See*—
Palomar, Juan M.; and Bird, Gary M., 4,449,520, Cl. 128-79.000.

Bismarck, Otto H., to RCA Corporation. Speed up circuit. 4,450,371, Cl. 307-475.000.

Black, Brent C.; Bradley, Bruce D.; and Haymore, Ralph B., to Envirotech Corporation. Granular media filter. 4,450,077, Cl. 210-275.000.

Black & Decker Inc.: *See*—
Sauerwein, William D.; Sides, Daniel H.; Weber, Steven A.; and Horney, James R., 4,449,329, Cl. 51-168.000.
Smith, Somers H., III, 4,449,660, Cl. 227-8.000.

Blackwell, Henry W., to Dresser Industries, Inc. Releasable tubing string connector. 4,449,736, Cl. 285-3.000.

Blatt, Leland F. Toggle action jaw-type gripper. 4,449,745, Cl. 294-88.000.

Blaupunkt-Werke GmbH: *See*—
Eilers, Norbert; and Bragas, Peter, 4,450,589, Cl. 455-205.000.

Blazek, William S.; and Piwonka, Thomas S., to TRW Inc. Method and apparatus for use in casting an article. 4,449,567, Cl. 164-137.000.

Bleuenstein, Julius M.: *See*—
Filipovitch, Anthony J.; and Bleuenstein, Julius M., 4,449,566, Cl. 164-5.000.

Bleuer, Keith T. Keyboard with elongate keys. 4,449,839, Cl. 400-485.000.

Blickstein, Martin J.: *See*—
Beckman, John B.; and Blickstein, Martin J., 4,449,893, Cl. 417-322.000.

Bloom Engineering Company, Inc.: *See*—
Finke, Harry P., 4,449,922, Cl. 432-64.000.

Bloothoofd, William, to Hercules Incorporated. Method and apparatus for producing a printing plate. 4,450,226, Cl. 430-300.000.

Blumenthal, Martin. Handle operable vehicles. 4,449,322, Cl. 46-202.000.

Blystone, Wayne G.; and Lemmon, Gerald W., to Chromalloy American Corporation. Heat exchanger fin element with dog-bone type pattern of corrugations. 4,449,581, Cl. 165-151.000.

Boaz, Premakaran T., to Ford Motor Company. Electric heater plate. 4,450,346, Cl. 219-522.000.

Bobb, Lloyd C., to United States of America, Navy. Triaxial optical fiber system for measuring magnetic fields. 4,450,406, Cl. 324-247.000.

Boeing Company, The: *See*—
Gratzer, Louis B.; and Gillette, Walter B., 4,449,680, Cl. 244-130.000.
Gratzer, Louis B.; and Gillette, Walter B., 4,449,681, Cl. 244-130.000.
Gratzer, Louis B.; and Gillette, Walter B., 4,449,682, Cl. 244-130.000.
Gratzer, Louis B.; and Gillette, Walter B., 4,449,683, Cl. 244-130.000.
Hapke, Donald W., 4,449,678, Cl. 244-12.500.
Howard, Bruce S., 4,450,405, Cl. 324-234.000.
Yankovoy, Alexander; and Ozer, Theodore, 4,449,865, Cl. 408-1.00R.

Bohme, Rolf; Rinderle, Heinz; and Sieber, Jurgen, to Telefunken Electronic GmbH. Thermoelectric level measuring device. 4,449,404, Cl. 73-295.000.

Boleda, Alberto; and Thomas, Terence N., to Northern Telecom Limited. Digital signal subscriber loop and interface circuit. 4,450,556, Cl. 370-58.000.

Bomar, Daryld W.: *See*—
Klepper, Robert; and Bomar, Daryld W., 4,449,896, Cl. 417-399.000.

BoMed Medical Mfg. Ltd.: *See*—
Sramek, Bohumir, 4,450,527, Cl. 364-415.000.

Bond, George L.; and Satya, Akella V. S., to International Business Machines Corporation. Memory system with selective assignment of spare locations. 4,450,559, Cl. 371-10.000.

Bonerb, Timothy C.; and Bonerb, Vincent C. Bin for storing and discharging free-flowing granular material. 4,449,646, Cl. 222-95.000.

Bonerb, Vincent C.: *See*—
Bonerb, Timothy C.; and Bonerb, Vincent C., 4,449,646, Cl. 222-95.000.

Borchers, Hans-Dieter, administrator: *See*—
Roder, Eberhard, deceased; Borchers, Hans-Dieter, administrator; and Dusing, Wolfgang, 4,449,651, Cl. 222-455.000.

Borg-Warner Chemicals, Inc.: *See*—
Hechenbleikner, Ingenuin; Enlow, William P.; and Lankin, David C., 4,450,113, Cl. 260-439.00R.

Borgman, Robert J.: *See*—
Erhardt, Paul W.; and Borgman, Robert J., 4,450,173, Cl. 424-309.000.

Bories, David G.: *See*—
McGuire, John; and Bories, David G., 4,449,941, Cl. 434-153.000.

Bosack, Donald J.: *See*—
Lambert, Frederick J.; Bosack, Donald J.; and Johansen, David K., 4,450,401, Cl. 320-22.000.

Bose, Bimal K., to General Electric Company. Microprocessor-based efficiency optimization control for an induction motor drive system. 4,450,398, Cl. 318-803.000.

Bouchard, Andre C., to GTE Products Corporation. Method of making photoflash lamp to prevent shred migration into tip portion of lamp envelope during sealing thereof. 4,449,950, Cl. 445-28.000.

Bourgeois, Claude: *See*—
Hermann, Jean; and Bourgeois, Claude, 4,450,378, Cl. 310-361.000.

Bowden, Scott: *See*—
Batra, Tarsaim L.; and Bowden, Scott, 4,450,021, Cl. 29-571.000.

Bowen, Robert F.; and Martel, Thomas J., to Raytheon Company. Microwave pizza maker. 4,450,334, Cl. 219-10.55E.

Boyadjieff, George I., to Varco International, Inc. Drilling of wells with top drive unit. 4,449,596, Cl. 175-85.000.

Brabant, Henri. Hanging device for curtain straps out of resilient plastic material for closing building openings. 4,449,270, Cl. 16-87.40R.

Brader, Walter H., Jr.: *See*—
Sanderson, John R.; Watts, Lewis W., Jr.; and Brader, Walter H., Jr., 4,450,290, Cl. 560-246.000.

Bradley, Bruce D.: *See*—
Black, Brent C.; Bradley, Bruce D.; and Haymore, Ralph B., 4,450,077, Cl. 210-275.000.

Bragas, Peter: *See*—
Eilers, Norbert; and Bragas, Peter, 4,450,589, Cl. 455-205.000.

Brammall, Inc.: *See*—
Gillette, Robert H.; Brammall, Terrence N.; Shelton, Kent; and Cramer, Chris, 4,449,328, Cl. 51-73.00R.

Brammall, Terrence N.: *See*—
Gillette, Robert H.; Brammall, Terrence N.; Shelton, Kent; and Cramer, Chris, 4,449,328, Cl. 51-73.00R.

Brandenstein, Manfred; and Hans, Rudiger, to SKF Kugellagerfabriken GmbH. Fastening means for axially securing machine elements and method therefor. 4,449,841, Cl. 403-24.000.

Branduzzi, Paolo: *See*—
Vitobello, Vincenza; Branduzzi, Paolo; and Cimini, Nadia, 4,450,238, Cl. 435-256.000.

Brannon, Judeth H.; and Schorfheide, James J., to Exxon Research and Engineering Co. Removal of sulfur from process streams. 4,449,991, Cl. 55-73.000.

Brasfiel, Bernard M., to Surgikos, Inc. Latex glove method and apparatus for making the same. 4,449,911, Cl. 425-374.000.

Brault, Richard A. Flotation device. 4,449,947, Cl. 441-81.000.

Briccetti, Mario F., to Carrier Corporation. Method and apparatus for controlling the operation of an indoor fan associated with an air conditioning unit. 4,449,375, Cl. 62-89.000.

Bridges, Jack E.; and Taflove, Allen, to IIT Research Institute. Apparatus and method for in situ controlled heat processing of hydrocarbonaceous formations. 4,449,585, Cl. 166-248.000.

Bridgestone Tire Company Limited: *See*—
Tansei, Hikaru; and Takigawa, Hiroyoshi, 4,449,560, Cl. 152-209.00R.

Bridgwater, Terry J. P.: *See*—
Askew, Herbert F.; Harrington, Colin J.; and Bridgwater, Terry J. P., 4,450,087, Cl. 252-73.000.

Briese, Wolfgang, to International Standard Electric Corporation. Integrated circuit with piezoelectric resonator mounted on blocks comprising capacitors. 4,450,377, Cl. 310-348.000.

Bright, Gary R., to Standard Oil Company (Indiana). Apparatus for measuring the relative position of a downhole tool in a bore hole. 4,450,539, Cl. 367-35.000.

Brill, Klaus; and Grothe, Wolfgang, to Robert Bosch GmbH. Multiple-layer heat barrier. 4,450,201, Cl. 428-336.000.

Brinkhaus, Stefan: *See*—
Rohrich, Manfred; and Brinkhaus, Stefan, 4,450,588, Cl. 455-192.000.

Bristol, James A.; and Puchalski, Chester, to Schering Corporation. Imidazo[1,2-A]pyridines and use. 4,450,164, Cl. 424-256.000.

Brocklehurst, John R.: *See*—
Drake, Cyril F.; and Brocklehurst, John R., 4,449,981, Cl. 604-890.000.

Brockman, Arthur M.: *See*—
Vernor, Oliver W.; and Brockman, Arthur M., 4,449,545, Cl. 137-68.00R.

Brodribb, Anthony G.: *See*—
Brodribb, Marcus T.; Brodribb, Anthony G.; and Baillie, David H., 4,449,317, Cl. 43-15.000.

Brodribb, Marcus T.; Brodribb, Anthony G.; and Baillie, David H. Fishing apparatus. 4,449,317, Cl. 43-15.000.

Brookes, Malcolm J.: *See*—
Burbo, James H.; Hartman, Louis P.; Spranger, Douglas M.; Brookes, Malcolm J.; and Mulhauser, Paul J., 4,449,787, Cl. 350-538.000.

Brooks, Robert A.; Banach, Terrance R.; Barman, Erik; and Livia, Michael R., to Magnetic Analysis Corporation. EMAT Test apparatus having retractable probe. 4,449,408, Cl. 73-643.000.

Brooks, Robert A.: *See*—
Suhr, Peter J.; Brooks, Robert A.; and Banach, Terrance R., 4,449,411, Cl. 73-643.000.

Brothers, Lance E.: *See*—
Childs, Jerry D.; Brothers, Lance E.; and Taylor, Mary J., 4,450,009, Cl. 106-76.000.

Brown, Douglas E. Bean harvest apparatus. 4,449,352, Cl. 56-13.100.

Brown, George L.; and Lee, Lindell E., Jr., to Lee, Lindell E., Jr. Agricultural clean-out drag. 4,449,591, Cl. 172-195.000.

Brown Group, Inc.: *See*—
Doerer, Daniel M., 4,450,130, Cl. 264-154.000.

Brown, Leroy L.: *See*—
Kenyon, Stephen C.; Simkins, Laura J.; Brown, Leroy L.; and Sebastian, Richard, 4,450,531, Cl. 364-604.000.

Brown, Sammy K.: *See*—
Solimeno, Duane; Brown, Sammy K.; Koeppen, Peter L.; and Rogers, Gerald, 4,450,534, Cl. 364-900.000.

Brown, William C., Jr.: *See*—
Kliger, Isaac E.; Brown, William C., Jr.; and Goldstein, David S., 4,450,410, Cl. 328-155.000.

Broze, Guy; and Laitem, Leopold, to Colgate-Palmolive Company. Stabilized bleaching and laundering composition. 4,450,089, Cl. 252-95.000.

Bruce, Gary D.: *See*—
Jageler, Alfred H.; Bruce, Gary D.; and Mount, Houston B., II, 4,449,593, Cl. 175-58.000.

Brunberg, Ernst-Ake: *See*—
Alfven, Hannes; Herlofson, Nicolai; Babic, Miroslav; and Brunberg, Ernst-Ake, 4,449,577, Cl. 165-104.120.

Brunelle, Rene J., to UOP Inc. Seat back mounting system. 4,449,875, Cl. 410-80.000.

Brunosson, Bengt B., to AB Bahco Verktyg. Screw wrench. 4,449,431, Cl. 81-165.000.

Brunswick Corporation: *See*—
Benedyk, Joseph C.; Amos, Homer C.; Scheie, Carl E.; and McGlone, William R., 4,449,712, Cl. 273-326.000.

Bruzzone, Mario: *See*—
Roggero, Arnaldo; Bruzzone, Mario; and Gandini, Alberto, 4,450,259, Cl. 526-173.000.

Bubb, Charles E.; and Mauch, Fred E., to Parkersburg Tank, Division of Maloney Crawford Corporation. Side-wall discharge system. 4,449,339, Cl. 52-195.000.

Bucher-Guyer AG: *See*—
Zullig, Heinz, 4,449,905, Cl. 425-117.000.

Buchholz, Rainer: *See*—
Zodrow, Rodolf; and Buchholz, Rainer, 4,450,040, Cl. 156-567.000.

Buckinx, Pol, to GTE Products Corporation. Surface acoustic wave filter. 4,450,420, Cl. 333-194.000.

Buckley, Michael E.; Tachirn, Thomas N.; McClure, Donald R.; and Wieland, Michael S., to United States of America, Navy. Cartridge case closure plug. 4,449,458, Cl. 102-430.000.

Budinger, A. Bowman: *See*—
Proud, Joseph M.; Riseberg, Leslie A.; Byszewski, Wojciech W.; and Budinger, A. Bowman, 4,450,380, Cl. 313-485.000.

Budzol, Melvin: *See*—
Tloczynski, James J.; Budzol, Melvin; Ahola, Clifford J.; and Rine, James C., 4,449,674, Cl. 241-245.000.

Bue, Richard C.: *See*—
Wilson, Kermit H.; and Bue, Richard C., 4,449,263, Cl. 5-133.000.

Buechler, Lester W., to Ohio Electronic Engravers, Inc. Engraving apparatus and method. 4,450,486, Cl. 358-299.000.

buhl Industries, Inc.: *See*—
De Longis, Vincent E.; and Kyhl, Henry, 4,449,800, Cl. 353-119.000.

Buhler-Miag GmbH: *See*—
Ullner, Klaus, 4,449,863, Cl. 406-182.000.

Buhrer, Carl F., to GTE Laboratories Incorporated. Inductive ballasting of direct current gas discharges. 4,450,385, Cl. 315-205.000.

Bulgier, Lawrence W., to Combustion Engineering, Inc. Method and apparatus for measuring elapsed time between an initiating event and a dependent event. 4,449,830, Cl. 368-119.000.

Buljan, Sergej-Tomislav: *See*—
Sarin, Vinod K.; and Buljan, Sergej-Tomislav, 4,449,989, Cl. 51-295.000.

Burbo, James H.; Hartman, Louis P.; Spranger, Douglas M.; Brookes, Malcolm J.; and Mulhauser, Paul J., to International Telephone and Telegraph Corporation. Night vision imaging system adapted for helmet mounting. 4,449,787, Cl. 350-538.000.

Burkard, Andrew M.: *See*—
Taglianetti, Philip C.; and Burkard, Andrew M., 4,449,341, Cl. 52-235.000.

Burkhalter, John F.; Childs, Jerry D.; and Sutton, David L., to Halliburton Company. Well cementing process and gasified cements useful therein. 4,450,010, Cl. 106-87.000.

Burnett, Betty L. C., administrator: *See*—
Burnett, C. H., deceased; and Burnett, Betty L. C., administrator, 4,450,073, Cl. 209-564.000.

Burnett, C. H., deceased; and by Burnett, Betty L. C., administrator. Automatic weight grading and sorting apparatus. 4,450,073, Cl. 209-564.000.

Burnham, Robert D.: *See*—
Scifres, Donald R.; Streifer, William; and Burnham, Robert D., 4,450,567, Cl. 372-50.000.

Burns, James A.; and Nugent, Edward L., to Becton Dickinson and Company. Automatic retractable lancet assembly. 4,449,529, Cl. 128-314.000.

Busak & Luyken: *See*—
Muller, Heinz K., 4,449,718, Cl. 277-170.000.

Buschbom, Floyd E.; and Hansen, Glen D., to Veda, Inc. Vehicle frame assembly. 4,449,606, Cl. 180-297.000.

Busse, Richard O. Universal removable insulation. 4,449,554, Cl. 138-149.000.

Bussiere, Ronald L.; and Smith, Robert J., to Solid State Systems, Corporation. Light generating apparatus for curing dental restorative composites. 4,450,139, Cl. 422-186.300.

Buzynski, John E.: *See*—
Stewart, Robert E.; Buzynski, John E.; and Giggi, Robert, 4,450,572, Cl. 375-87.000.

Buzzi, Gunther, to Hans Grohe GmbH & Co. Pressure hose. 4,449,740, Cl. 285-149.000.

Buzzichelli, Lilian; and Roy, Kleber, to Enterprises Buzzichelli. Hoisting assembly with a boom and a counterweight having adjustable respective positions. 4,449,634, Cl. 212-196.000.

Byer, Robert L.: *See*—
Murray, Edward R.; van der Laan, Jan E.; Rosengreen, Arne; and Byer, Robert L., 4,450,356, Cl. 250-339.000.

Byrd, Carlisle O., Jr.: *See*—
Hounsel, Mack A.; and Byrd, Carlisle O., Jr., 4,449,345, Cl. 52-506.000.

Byszewski, Wojciech W.: *See*—
Proud, Joseph M.; Riseberg, Leslie A.; Byszewski, Wojciech W.; and Budinger, A. Bowman, 4,450,380, Cl. 313-485.000.

Bzdula, Joseph A., to Carrier Corporation. Probe for measuring electrical conductance. 4,449,396, Cl. 73-61.10R.

Cabot Corporation: *See*—
Herchenroeder, Robert B.; and Heath, Boyd A., 4,450,007, Cl. 75-10.00C.

Cafarelli, Ralph J. Stabilization of molded parts. 4,450,133, Cl. 264-336.000.

Caldwell, John W., to Pennwalt Corporation. Conveyor flight configuration. 4,449,967, Cl. 494-54.000.

California Institute of Technology: *See*—
Wang, Taylor G.; Elleman, Daniel D.; and Kendall, James M., Jr., 4,449,901, Cl. 425-6.000.

Calloway, Danny L. Board game simulating business principles involving petroleum commodities. 4,449,711, Cl. 273-256.000.

Cam Gears Limited: *See*—
Adams, Frederick J., 4,449,601, Cl. 180-148.000.

Cameron, Wallace C., to Copper Alloys Corporation. Reduction mill. 4,449,673, Cl. 241-186.00R.

Campbell, Sterrett P. Dough pump. 4,449,908, Cl. 425-204.000.

Canon Kabushiki Kaisha: *See*—
Furuichi, Katsushi; and Takahata, Naomi, 4,449,812, Cl. 355-14.0SH.
Kitamura, Takashi; Watanabe, Asao; Nakano, Takashi; Masaki, Katsumi; Hirayama, Kazuhiro; Sato, Yasushi; and Tokiwa, Taisuke, 4,450,453, Cl. 346-108.000.
Miyachi, Takeshi; Tsuda, Hisanori; Hara, Toshitami; and Kasugayama, Yukio, 4,450,457, Cl. 346-140.00R.
Nakamura, Zenzo, 4,449,802, Cl. 354-416.000.
Sakurada, Nobuaki; Kawamura, Masaharu; Ohtaki, Shohei; Nakamoto, Soichi; and Shinoda, Nobuhiko, 4,449,805, Cl. 354-105.000.
Shimizu, Isamu; Ogawa, Kyosuke; and Inoue, Eiichi, 4,450,185, Cl. 427-39.000.
Sugitani, Hiroshi; Ozawa, Masakazu; Matsuda, Hiroto; Ikeda, Masami; and Matsumoto, Haruyuki, 4,450,455, Cl. 346-140.0PQ.
Watanabe, Yoshitaka; and Kazumi, Jiro, 4,449,804, Cl. 354-418.000.
Yamada, Masanori; and Hiramatsu, Akira, 4,449,803, Cl. 354-416.000.

Canron Corp.: *See*—
Cicin-Sain, Ivo, 4,449,459, Cl. 104-12.000.

Capdeboscq, Bernard: *See*—
Barny, Jean-Jacques; and Capdeboscq, Bernard, 4,449,450, Cl. 101-232.000.

Cappis, Lona P. Belt supported backpack. 4,449,654, Cl. 224-148.000.

Carden, John C., to Quadrant Drive BV. Motion transmitting devices. 4,449,425, Cl. 74-804.000.

Carl Schenck AG: *See*—
Toerner, Ludger; Garvens, Dieter; Hager, Gunter; and Rettinger, Anton, 4,449,742, Cl. 285-236.000.

Carley, James A. Self centering underground mine lamp. 4,450,508, Cl. 362-105.000.

Carlisle, Robert W.: *See*—
Adair, Noel J.; Carlisle, Robert W.; Stubbs, Michael E.; and Rooney, John J., 4,450,245, Cl. 502-211.000.

Carmer, Richard V.: *See*—
Saunders, Hollis S.; Carmer, Richard V.; and Payette, Lionel J., 4,449,290, Cl. 29-596.000.

Carmo, Robert A.; and Dietz, Ernest W., to Pacific Electricord Company. Electrical connector having opposed locking ramp members. 4,449,776, Cl. 339-91.00R.

Carr, David W. Bus bar. 4,449,771, Cl. 339-19.000.

Carrier Corporation: *See*—
Briccetti, Mario F., 4,449,375, Cl. 62-89.000.
Bzdula, Joseph A., 4,449,396, Cl. 73-61.10R.

Carriere, Donald L., to Ford Motor Company. Traction drive automatic transmission for gas turbine engine driveline. 4,449,423, Cl. 74-688.000.

Carrillo, Ernest V. Screed board apparatus. 4,449,845, Cl. 404-118.000.

Carroll, Michael B.: *See*—
Angevine, Philip J.; Carroll, Michael B.; Shih, Stuart S.; and Tabak, Samuel A., 4,450,067, Cl. 208-86.000.

Cartier, Roger J., to Whirlpool Corporation. Combination lid and excursion switch and alarm for automatic washers. 4,449,383, Cl. 68-12.00R.

Casals-Stenzel, Jorge: *See*—
Nickisch, Klaus; Laurent, Henry; Wiechert, Rudolf; and Casals-Stenzel, Jorge, 4,450,107, Cl. 424-238.000.

Cash, Leonard D., to Fiber Controls Corporaton. Chute feed adjustment for card evenness. 4,449,272, Cl. 19-105.000.

Castleman, B. Wayne; Donehoo, Robert F.; Oswald, Rudolph G.; Reed, Kenneth L.; and Shipley, George H., to Honeywell Inc. Pressure sensor and leak detector. 4,450,409, Cl. 324-460.000.

Catallo, Frank. Combined oven and fume incinerator and method of operating same. 4,449,921, Cl. 432-8.000.

Caterpiller Tractor Co.: *See*—
Balitch, Paul, 4,449,357, Cl. 59-30.000.

Cavanagh, Peter R., to PUMA-Sportschuhfabriken Rudolf Dassler KG. Running shoe sole construction. 4,449,306, Cl. 36-30.00R.

Cawood, Charles D. Urine collection method. 4,449,971, Cl. 604-54.000.

CCL Industries Inc.: *See*—
Suk, Albert, 4,450,253, Cl. 524-378.000.

Celanese Corporation: *See*—
McMillan, William P.; Hobbs, Charles C., Jr.; Gerberich, H. Robert; and Junker, Michael L., 4,450,301, Cl. 568-473.000.
Ochiai, Shinya, 4,450,074, Cl. 210-96.100.
Stafford, Gery R., 4,450,055, Cl. 204-78.000.

Celmer, Walter D.; Cullen, Walter P.; Shibakawa, Riichiro; and Tone, Junsuke, to Pfizer Inc. *Streptomyces albus* subspecies indicus. 4,450,237, Cl. 435-253.000.

Censor Patent- Und Versuchs-Anstalt: *See*—
Sawatzki, Harry, 4,449,650, Cl. 222-309.000.

Central Glass Company, Limited: *See*—
Kondow, Takeshi; Okazaki, Koshi; Katsuhara, Yutaka; and Matsuoka, Kimiaki, 4,450,298, Cl. 568-437.000.

Centre Electronique Horloger S.A.: *See*—
Hermann, Jean; and Bourgeois, Claude, 4,450,378, Cl. 310-361.000.

Centrifugal Piston Expander Inc.: *See*—
Dibrell, Edwin W., 4,449,379, Cl. 62-401.000.

Ceretti, Claudia. Industrial furnace. 4,449,924, Cl. 432-138.000.

Cerwin, Robert J.; Joshi, Madhusudan; Menges, John R.; Mericle, Robert W.; and Zwaskis, William J., to Ethicon, Inc. Non-metallic, bio-compatible hemostatic clips with interlocking latch means. 4,449,531, Cl. 128-325.000.

Cessou, Maurice; and Perez, Lucien, to Institut Francais du Petrole. Antipollution device for recovering fluids lighter than water escaping from an underwater source. 4,449,850, Cl. 405-60.000.

Cetus Corporation: *See*—
Konrad, Michael W.; and Lin, Leo S., 4,450,103, Cl. 260-112.00R.

Chapel Reprographie: *See*—
Archambault, Marcel, 4,449,963, Cl. 493-414.000.

Charm, Richard W.: *See*—
Nuzzi, Francis J.; Leech, Edward J.; Charm, Richard W.; and Polichette, Joseph, 4,450,190, Cl. 427-304.000.

Chatterton, Robert T., to Northwestern University. Method of determining pregnanediol in female urine and test device for use therein. 4,450,239, Cl. 436-510.000.

Chemetals Incorporated: *See*—
Welsh, Jay Y., 4,450,148, Cl. 423-605.000.

Chemische Fabriek Zaltbommel, B.V.: *See*—
van der Mass, Hendrikus J. H., 4,450,295, Cl. 564-294.000.

Chemische Werke Huels Aktiengesellschaft: *See*—
Fischer, Lothar; Hausen, Manfred Z.; and Wember, Kurt, 4,450,300, Cl. 568-462.000.

Chen, Fu-Chuan: *See*—
Yum, Lawrence H.; and Chen, Fu-Chuan, 4,450,418, Cl. 333-128.000.

Cheng, Yu-Chen: *See*—
Su, Tsung-Tsan; and Cheng, Yu-Chen, 4,450,271, Cl. 544-354.000.

Chessin, Hyman; and Knill, Edmund C., to M&T Chemicals Inc. Process for bonding high efficiency chromium electrodeposits. 4,450,050, Cl. 204-41.000.

Chessin, Hyman: *See*—
McMullen, Warren H.; Chessin, Hyman; and Siracusa, Denise, 4,450,052, Cl. 204-51.000.

Chevron Research Company: *See*—
Aoyagi, Edward I., 4,450,278, Cl. 548-376.000.
Wollenberg, Robert H., 4,450,281, Cl. 549-255.000.

Chi, Ching T.; and Lester, J. Harvey, Jr., to Monsanto Company. Decontamination of KA oil refinement waste stream. 4,450,291, Cl. 562-530.000.

Chiao, Wen B.; and Ray-Chaudhuri, Dilip K., to National Starch and Chemical Corporation. Preparation of low molecular weight styrene-

maleic anhydride copolymers and sulfonated copolymers thereof. 4,450,261, Cl. 526-214.000.

Chicago Bridge & Iron Company: *See—*
Haynie, Timothy J., 4,449,368, Cl. 60-652.000.

Childs, Jerry D.; Brothers, Lance E.; and Taylor, Mary J., to Halliburton Company. Method of preparing a light weight cement composition from sea water. 4,450,009, Cl. 106-76.000.

Childs, Jerry D.: *See—*
Burkhalter, John F.; Childs, Jerry D.; and Sutton, David L., 4,450,010, Cl. 106-87.000.

Chin, Raymond, to Rockwell International Corporation. Multiple-quantum-layer photodetector. 4,450,463, Cl. 357-30.000.

Chinoin Gyogyszer es Vegyeszeti Termekek Gyar Rt.: *See—*
Soos, Rudolf; Nemes, Jozsef; Vidra, Laszlo; Szelestei, Miklos; Kovacs, Gabor; and Szekeley, Istvan, 4,450,309, Cl. 570-217.000.

Chisso Corporation: *See—*
Sato, Hideo; Goto, Yasuyuki; Saito, Hideo; Sawada, Shinichi; Matsunami, Keiichi; and Hirata, Kohzo, 4,450,094, Cl. 252-299.610.

Chloe Chimie: *See—*
Laroche, Paul; and Pompon, Jean-Bernard, 4,450,189, Cl. 427-236.000.

Cho, Edward, to Polymatic Investment Corp., N.V. Siloxane-containing polymers and contact lenses therefrom. 4,450,264, Cl. 526-279.000.

Cho, Frederick Y.; and Hickernell, Fred S., to Motorola Inc. Oxygen-plasma passivated and low scatter acoustic wave devices. 4,450,374, Cl. 310-313.00B.

Christensen, Byron. Inflatable flowing hole plug. 4,449,584, Cl. 166-187.000.

Christidis, Yani; and Fournex, Robert, to Roussel Uclaf. Derivatives of phenyl aliphatic carboxylic acids, and use thereof in treating gastric and gastro-duodenal ailments. 4,450,292, Cl. 562-463.000.

Christmann, Wolfgang; Lindner, Gerhard; and Lingens, Paul, to Dynamit Nobel Aktiengesellschaft. Production of compacted, large-caliber explosive charges. 4,450,124, Cl. 264-3.00R.

Chromalloy American Corporation: *See—*
Blystone, Wayne G.; and Lemmon, Gerald W., 4,449,581, Cl. 165-151.000.

Chuang, Locus Y.: *See—*
Sienkiewicz, Boleslaw; Kramer, Franklin; Klein, Imrich; Oldershaw, C. G. Peter; and Chuang, Locus Y., 4,449,906, Cl. 425-131.100.

Chugai Ro Kogyo Co., Ltd.: *See—*
Shimosato, Yoshikazu, 4,449,923, Cl. 432-82.000.

Ciba-Geigy Corporation: *See—*
Fory, Werner; Martin, Henry; and Pissiotas, Georg, 4,450,000, Cl. 71-105.000.
Sturm, Elmar; Schempp, Heinrich; and Martin, Henry, 4,449,999, Cl. 71-73.000.

Cicin-Sain, Ivo, to Canron Corp. Pivoting head continuous tamper. 4,449,459, Cl. 104-12.000.

Cimini, Nadia: *See—*
Vitobello, Vincenza; Branduzzi, Paolo; and Cimini, Nadia, 4,450,238, Cl. 435-256.000.

Clairol Incorporated: *See—*
Kinney, James, 4,450,090, Cl. 252-106.000.

Clancy, Steven J.; and Phillips, Robert A., to Westinghouse Electric Corp. Method and system for tracking targets in a pulse doppler radar system. 4,450,446, Cl. 343-7.700.

Clarion Co., Ltd.: *See—*
Okada, Hitoshi; Takai, Kazuki; and Yamaguchi, Katsumi, 4,450,492, Cl. 360-105.000.
Takagi, Satoshi; Watanabe, Toshio; and Ito, Masao, 4,450,491, Cl. 360-96.500.
Watanabe, Tadaaki; and Tanaka, Yoshio, 4,449,955, Cl. 464-78.000.

Clark, Ronald G., to Synergetics, Inc. Mobile computerized tomography unit. 4,449,746, Cl. 296-1.00R.

Clemence, Francois; Hunt, Peter F.; Le Martret, Odile; and Humbert, Daniel, to Roussel Uclaf. N-(4,5-Dihydro-thiazol-2-yl)-3-quinolinecarboxamides having anxiolytic activity. 4,450,166, Cl. 424-258.000.

Clements, Thomas W.: *See—*
Fallon, Merton R.; and Clements, Thomas W., 4,449,412, Cl. 73-738.000.

Coates, Terence J., to Smiths Industries Public Limited Company. Fluid-responsive apparatus. 4,449,414, Cl. 73-861.370.

Coca-Cola Company, The: *See—*
Davis, Charles L.; and Bachman. G. Merle, 4,449,761, Cl. 312-116.000.

Cogliano, Joseph A., to W. R. Grace & Co. Construction barrier board. 4,450,192, Cl. 428-40.000.

Cohnen, Wolfgang: *See—*
Schmidt, Manfred; Wank, Joachim; Reese, Eckart; Freitag, Dieter; Wangermann, Klaus; and Cohnen, Wolfgang, 4,450,249, Cl. 524-132.000.

Colditz, Werner, to Mannesmann Aktiengesellschaft. Apparatus for bunching and severing wire coils. 4,449,435, Cl. 83-167.000.

Cole, Edward F.; and Crombie, Dean H., to United Technologies Corporation. Automatic vent for fuel control. 4,449,359, Cl. 60-39.094.

Coleman, Leonard R.: *See—*
Dunn, Ralph; and Coleman, Leonard R., 4,450,129, Cl. 264-132.000.

Coleman, Robert F.: *See—*
Gilbride, Andrew J.; Malecki, Edward S.; Winslow, Edward H., III; and Coleman, Robert F., 4,449,463, Cl. 112-121.260.

Coles Cranes Limited: *See—*
Telfer, James D., 4,449,600, Cl. 180-132.000.

Colgate-Palmolive Company: *See—*
Broze, Guy; and Laitem, Leopold, 4,450,089, Cl. 252-95.000.
Wixon, Harold E., 4,450,085, Cl. 252-8.750.

Colson, Wendell B. Method and apparatus for fabricating honeycomb insulating material. 4,450,027, Cl. 156-193.000.

Colton, Peter M., to Wadkin plc. Rotary cutter heads. 4,449,556, Cl. 144-230.000.

Combes, Gilles; and Delage, Germain, to Alsthom-Atlantique. Energy-efficient automatic sluice gate for sustaining a fluid level. 4,449,851, Cl. 405-93.000.

Combustion Engineering, Inc.: *See—*
Bulgier, Lawrence W., 4,449,830, Cl. 368-119.000.
Creek, Ronald B., 4,449,599, Cl. 180-8.100.

Compaganie Internationale pour l'Informatique CII-Honeywell Bull (Societe Anonyme): *See—*
de Pommery, Bertrand J. C. H.; Petiot, Gerard L. R.; Vergne, Jean-Claude E.; and Goupil, Jean-Paul C., 4,449,775, Cl. 339-75.0MP.

Compagnie du Moteur Energitique C.M.E. Inc.: *See—*
Beaudoin, Normand, 4,449,494, Cl. 123-52.00A.

Compagnie Industrielle des Lasers Cilas Alcatel: *See—*
Renault, Guy, 4,449,535, Cl. 128-634.000.

Compagnie Internationale pour l'Informatique CII-Honeywell Bull (Societe Anonyme): *See—*
de Pommery, Bertrand J. C. H.; and Ugon, Michel, 4,450,535, Cl. 364-900.000.
Gerard, Andre, 4,450,516, Cl. 363-84.000.

Conarty, Thomas J., Jr.: *See—*
Rice, David A.; Greenbaum, Robert R.; and Conarty, Thomas J., Jr., 4,450,046, Cl. 201-20.000.

Conn, Charles E., Jr., to TRE Corporation. Method of fabricating a truss core sandwich panel. 4,450,338, Cl. 219-78.120.

Conner, George W., to Teradyne, Inc. Tester for LSI devices and memory devices. 4,450,560, Cl. 371-25.000.

Conner, Leo B., Jr.; and Nelson, Robert N., to Motorola Inc. Range rate dependent pulse control apparatus and method therefor. 4,450,445, Cl. 343-7.500.

Conoco Inc.: *See—*
Beck, Jeffrey L., 4,449,862, Cl. 406-93.000.

Conrad, Rene A. Positive tracking pulley and belt construction. 4,449,958, Cl. 474-205.000.

Consolidated Foods Corporation: *See—*
DiTullio, Flavia, 4,449,533, Cl. 128-454.000.

Consort Aluminium Limited: *See—*
Rawlings, David E., 4,449,325, Cl. 49-192.000.

Continental Group, Inc., The: *See—*
Krishnakumar, Suppayan M.; Harry, Leuan L.; and Beck, Martin H., 4,449,913, Cl. 425-548.000.

Controlonics Corporation: *See—*
Lucey, Robert E., 4,450,319, Cl. 179-2.0EA.

Cook, James S.; and Lennon, J. Anthony, to General Electric Company. Low cost high isolation voltage optocoupler with improved light transmissivity. 4,450,461, Cl. 357-19.000.

Cooper Industries, Inc.: *See—*
Johnson, Thomas B., III, 4,449,772, Cl. 339-29.00B.
Mayer, James R., 4,449,592, Cl. 175-52.000.

Cooper, Leonard M.: *See—*
Johnson, Harold D.; Sherman, Earle C.; and Cooper, Leonard M., 4,449,633, Cl. 206-612.000.

Copeland, John A., to Bell Telephone Laboratories, Incorporated. Spectrally stabilized laser. 4,450,565, Cl. 372-32.000.

Copia, Carlos R. D. S., to Maquinas Npu Ltda. Cutting/sealing device for plastic bag making machines. 4,449,962, Cl. 493-209.000.

Copolymer Rubber & Chemical Corp.: *See—*
Von Bodungen, George A.; and Karg, Rudy F., 4,450,260, Cl. 526-213.000.

Copper Alloys Corporation: *See—*
Cameron, Wallace C., 4,449,673, Cl. 241-186.00R.

Coppins, Jerry B.: *See—*
Coppins, Timothy G.; and Coppins, Jerry B., 4,449,652, Cl. 223-46.000.

Coppins, Timothy G.; and Coppins, Jerry B. Prefabricated bow forming machine. 4,449,652, Cl. 223-46.000.

Coral Industrial Sales Co.: *See—*
Siegal, Burton L., 4,450,498, Cl. 361-212.000.

Corbett, Scott S., Jr.: *See—*
Perrott, Lynn F., 4,449,882, Cl. 414-665.000.

Corbitt, John; and Michel, Thomas J. Medical-electronic body fluid accounting system. 4,449,538, Cl. 128-760.000.

Corby, Nelson R., Jr., to General Electric Company. Welding torch with vision attachment. 4,450,339, Cl. 219-124.340.

Corrigall, Don J.; and Schiedermayer, Marvin L., to Miller Electric Manufacturing Company. Arc welder power supply with fail-safe voltage reducing circuit. 4,450,340, Cl. 219-132.000.

Cortese, Richard; Barclay, Brian; and Theeuwes, Felix, to ALZA Corporation. Simultaneous delivery of two drugs from unit delivery device. 4,449,983, Cl. 604-892.000.

Cory, William W., to Hydra-Jack, Inc. Mechanical locking outrigger hydraulic jack for an outrigger assembly. 4,449,734, Cl. 280-766.100.

Cotton, Robert B., Jr.; and Uetrecht, Dale M., to Baldwin Piano & Organ Company. Automatic piano. 4,449,437, Cl. 84-1.010.

Courvoisier, Guy; and Arieh, Simon, to Battelle Memorial Institute. Heating body. 4,450,347, Cl. 219-549.000.

Coutin, Pierre: *See—*
Lerouge, Andre; Andre, Jean-Louis; and Coutin, Pierre, 4,449,920, Cl. 431-91.000.

Couture, Paul A.: *See—*
Jentoft, Arthur P.; and Couture, Paul A., 4,449,340, Cl. 52-200.000.

Coviello, John W., to Westinghouse Electric Corp. Circuit for improving the quality of digitized line images. 4,450,483, Cl. 358-166.000.

CPC International Inc.: *See—*
Dean, Donald H.; and Ellis, Daniel M., 4,450,235, Cl. 435-253.000.
Dean, Donald H.; and Ellis, Daniel M., 4,450,236, Cl. 435-253.000.

Craft, James A. Ribbon cartridge with back check. 4,449,837, Cl. 400-208.000.

Cramer, Chris: *See—*
Gillette, Robert H.; Brammall, Terrence N.; Shelton, Kent; and Cramer, Chris, 4,449,328, Cl. 51-73.00R.

Creek, Ronald B., to Combustion Engineering, Inc. Finger walker for tube sheet. 4,449,599, Cl. 180-8.100.

Crivello, James V.; and Lee, Julia L., to General Electric Company. Alkylaryliodonium salts and method for making. 4,450,360, Cl. 260-440.000.

Crockatt, William B.; and Rinma, John, to DeSoto, Inc. Air drying coatings having long term water repellency. 4,450,247, Cl. 523-518.000.

Crombie, Dean H.: *See—*
Cole, Edward F.; and Crombie, Dean H., 4,449,359, Cl. 60-39.094.

Cros, Pierre, to Promecam Sisson-Lehmann. Device for bending a tool holder of a folding press or the like. 4,449,389, Cl. 72-389.000.

Crosby Valve & Gage Company: *See—*
Soderberg, Roy E., 4,449,544, Cl. 137-15.000.

Crown Textile Company: *See—*
Kamat, Dattatraya V., 4,450,196, Cl. 428-197.000.

Cruz, Ezequiel D., to Respiratory Care, Inc. Container having an air tight seal. 4,449,984, Cl. 604-319.000.

Cullen, Walter P.: *See—*
Celmer, Walter D.; Cullen, Walter P.; Shibakawa, Riichiro; and Tone, Junsuke, 4,450,237, Cl. 435-253.000.

Cunningham, James F.: *See—*
Pitzer, Ken; Cunningham, James F.; and Pearce, Jai, 4,449,701, Cl. 266-218.000.

Curatolo, Benedict S.: *See—*
Fox, Joseph R.; Curatolo, Benedict S.; and Pesa, Frederick A., 4,450,310, Cl. 585-400.000.

Curchod, Donald B. Drive shaft mounting assembly for dynamic wheel balancing machine. 4,449,407, Cl. 73-462.000.

Curtis Screw Company, Inc.: *See—*
Smith, James R., 4,449,432, Cl. 82-3.000.

Custer, Willard R. Atmospheric pressure motor. 4,449,363, Cl. 60-370.000.

Custom Wrought Products, Co.: *See—*
Reichman, William, Jr., 4,449,842, Cl. 403-25.000.

Cutter Laboratories, Inc.: *See—*
Jordan, Robert E., 4,450,104, Cl. 260-112.00B.

Cyklop International Emil Hoffmann KG: *See—*
Wehr, Hubert, 4,450,032, Cl. 156-353.000.

Czerniakiewicz, Anastasia J.: *See—*
Pilat, John F.; Czerniakiewicz, Anastasia J.; Kinder, David B.; and Davidian, Gary, 4,450,523, Cl. 364-200.000.

D.M.E. Plastic A/S: *See—*
Jorgensen, Knud E.; and Ingemann, Ole, 4,449,641, Cl. 220-306.000.

Dagens Nyheters AB: *See—*
Olsson, Christer H. K., 4,450,352, Cl. 250-223.00R.

Dahlberg, Reinhard, to Licentia Patent-Verwaltungs GmbH. Method for producing a semicondiuctor layer solar cell. 4,449,286, Cl. 29-572.000.

Daimler-Benz Aktiengesellschaft: *See—*
Strifler, Paul; Geissler, Heinrich; Ludtke, Dieter; Maurath, Rudolf; and Steinecke, Rudolf, 4,449,726, Cl. 280-81.00A.

Dalzell, Rex J.: *See—*
Holmes, Brian N.; Dalzell, Rex J.; and Aasen, Steven M., 4,450,227, Cl. 430-339.000.

Daniel, Leroy O.: *See—*
Berecz, Imre; Schultz, Dennis; and Daniel, Leroy O., 4,449,283, Cl. 29-566.100.

Daniele, Joseph J.: *See—*
Araghi, Mehdi N.; and Daniele, Joseph J., 4,450,458, Cl. 346-155.000.

Dany, Jean-Claude: *See—*
Thirion, Andre; Sorba, Antoine; Dany, Jean-Claude; Pacaud, Andre; and Attal, Gerard, 4,449,385, Cl. 70-277.000.

Dare, Roy R.: *See—*
Alexander, William H.; and Dare, Roy R., 4,449,695, Cl. 251-214.000.

Darling Store Fixtures: *See—*
Kersey, Melvin L., 4,449,686, Cl. 248-215.000.

Data General Corporation: *See—*
Pilat, John F.; Richmond, Michael S.; Wallach, Walter A., Jr.; and Schleimer, Stephen I., 4,450,522, Cl. 364-200.000.
Pilat, John F.; Czerniakiewicz, Anastasia J.; Kinder, David B.; and Davidian, Gary, 4,450,523, Cl. 364-200.000.

Dautel, Erich: *See—*
Liebhardt, Josef; Fuhrer, Rudolf; and Dautel, Erich, 4,449,454, Cl. 102-226.000.

Dauvergne, Jean L. R., to Valeo Societe Anonyme. Power assisted hydraulic control system. 4,449,369, Cl. 60-556.000.

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Pilat, John F.; Czerniakiewicz, Anastasia J.; Kinder, David B.; and Davidian, Gary, 4,450,523, Cl. 364-200.000.

Davidowitz, David: *See—*
Mennella, Robert J.; and Davidowitz, David, 4,449,853, Cl. 405-184.000.

Davidson, Bruce L.: *See—*
Peake, Clinton J.; Harnish, Wayne N.; and Davidson, Bruce L., 4,450,269, Cl. 544-8.000.

Davies, Evan; and Marmon, John C., Jr. Flush tank metering device. 4,449,259, Cl. 4-415.000.

Davignon, Paul A., to American Optical Corporation. Liquid dispenser. 4,449,477, Cl. 118-694.000.

Davis, Charles L.; and Bachman, G. Merle, to Coca-Cola Company, The. Transparent refrigerator doors with frosted product logo thereon. 4,449,761, Cl. 312-116.000.

Davis, Edgar A., to VSL Corporation. Retained earth system with threaded connection between a retaining wall and soil reinforcement panels. 4,449,857, Cl. 405-286.000.

Davis, Eugene E., to Johnsen & Jorgensen (Plastics) Ltd. Tamper-resistant and child-resistant closure and container assembly. 4,449,638, Cl. 215-211.000.

Davis, Eugene E., to Johnsen & Jorgensen (Plastics) Ltd. Tamper-resistant and child-resistant closures. 4,449,639, Cl. 215-224.000.

Davis, James W.: *See—*
Betron, Frank A.; Davis, James W.; Kockler, Barry C.; and Spears, Lonnie K., 4,449,811, Cl. 355-3.0SH.

Davis, Norman A. Game board, die and reward determining game apparatus. 4,449,710, Cl. 273-249.000.

Davis, Stephen G., to Union Carbide Corporation. Lithium halide additives for nonaqueous cell systems. 4,450,214, Cl. 429-194.000.

Davis, Thomas T., to Phillips Petroleum Company. Active termination for a transmission line. 4,450,370, Cl. 307-475.000.

De La Cierva, Juan, to Scitech Corporation. Synchronization interface device for autonomus video equipment. 4,450,480, Cl. 358-149.000.

Dean, Donald H.; and Ellis, Daniel M., to CPC International Inc. Asporogenic mutant of bacillus subtilis useful as a host in a host-vector system. 4,450,235, Cl. 435-253.000.

Dean, Donald H.; and Ellis, Daniel M., to CPC International Inc. Asporogenic mutant of *Bacillus subtilis* useful as a host in a host-vector system. 4,450,236, Cl. 435-253.000.

Dear, Buck; and Spencer, Tim. Calf cart. 4,449,481, Cl. 119-96.000.

De Blauwe, Francis J. A. M. C., to N.V. Raychem S.A. Thermochromic composition. 4,450,023, Cl. 156-64.000.

Debley, William P.: *See—*
Kwon, Tae M.; and Debley, William P., 4,450,407, Cl. 324-304.000.

Deere & Company: *See—*
Wohlford, William P.; and Beitel, Howard V., 4,449,758, Cl. 305-12.000.

Degnan, William G.; and Fansler, John D., to United Technologies Corporation. Ballistically tolerant control system. 4,449,446, Cl. 92-146.000.

deGroot, Johan: *See—*
Versluis, Jan; deGroot, Johan; and van Baalen, Anton, 4,449,946, Cl. 441-4.000.

Degussa Aktiengesellschaft: *See—*
Domesle, Rainer; Volker, Herbert; Koberstein, Edgar; and Pletka, Hans-Dieter, 4,450,244, Cl. 502-185.000.
Eiermann, Kurt; Horlebein, Eberhard; Lissmann, Kurt; and Schafer, Wolfgang, 4,449,402, Cl. 73-204.000.

Delage, Germain: *See—*
Combes, Gilles; and Delage, Germain, 4,449,851, Cl. 405-93.000.

Delfino, Gerolamo; and Franco, Simone, to Minnesota Mining and Manufacturing Company. Photographic elements with improved surface characteristics. 4,450,230, Cl. 430-539.000.

De Longis, Vincent E.; and Kyhl, Henry, to buhl Industries, Inc. Portable overhead projector. 4,449,800, Cl. 353-119.000.

Demuth, Gordon L.; Hinkle, John E.; and Moran, J. Thomas, to International Business Machines Corporation. Control unit for a functional processor. 4,450,525, Cl. 364-200.000.

Denaro, Alfred; and Rand, George, to Sperry Corporation. Absorptive sonar baffle. 4,450,544, Cl. 367-176.000.

Denka Engineering Kabushiki Kaisha: *See—*
Saito, Hisatoshi; Fujii, Shuzo; Takase, Itaru; Nakamura, Akihiko; and Hara, Yoshihiro, 4,449,861, Cl. 406-39.000.

Denney, Joseph M.: *See—*
Barry, James D.; and Denney, Joseph M., 4,450,489, Cl. 358-348.000.

de Pommery, Bertrand J. C. H.; Petiot, Gerard L. R.; Vergne, Jean-Claude E.; and Goupil, Jean-Paul C., to Compaganie Internationale pour l'Informatique CII-Honeywell Bull (Societe Anonyme). Connector for portable objects such as credit cards. 4,449,775, Cl. 339-75.0MP.

de Pommery, Bertrand J. C. H.; and Ugon, Michel, to Compagnie Internationale pour l'Informatique CII-Honeywell Bull (Societe Anonyme). System and method for authorizing access to an article distribution or service acquisition machine. 4,450,535, Cl. 364-900.000.

Dergo, Stephen J. Dowel drill fixture. 4,449,867, Cl. 408-103.000.

Dernar, Helen D.: *See—*
Eskamani, Abolghassem; Dernar, Helen D.; and Bartoszek-Loza, Rosemary, 4,450,059, Cl. 204-158.00R.

De Rossett, Terry A.: *See—*
Kurtz, Stuart J.; De Rossett, Terry A.; and Shaw, Montgomery T., 4,449,395, Cl. 73-56.000.

DeSantis, Raymond P.; and Puffer, Herbert J., Jr., to PTX Pentronix, Inc. Method for compacting powder material with adjustable die and punch assembly. 4,450,127, Cl. 264-56.000.

DeSoto, Inc.: *See*—
Crockatt, William B.; and Rimma, John, 4,450,247, Cl. 523-518.000.
Ragas, Frank J.; Minnis, Ralph L.; and Beauchamp, Gerson E., 4,450,203, Cl. 428-514.000.
Zychowski, Edwin A.; and Richards, Ronald L., 4,450,251, Cl. 524-251.000.

Detty, Michael R.; and Perlstein, Jerome H., to Eastman Kodak Company. Chalcogenopentalene compounds in electrophotography. 4,450,217, Cl. 430-58.000.

Deubel, Reinhold: *See*—
Diery, Helmut; Deubel, Reinhold; and Weide, Joachim, 4,450,304, Cl. 568-609.000.

Deutsch, Hermann: *See*—
Kruger, Hermann; and Deutsch, Hermann, 4,449,487, Cl. 123-41.340.

De Vault, Robert T.: *See*—
Baker, Kenneth R.; and De Vault, Robert T., 4,449,944, Cl. 440-47.000.

DeVito, Vivian C.: *See*—
Larson, Robert W.; Lou, Wen C.; DeVito, Vivian C.; and Neidinger, Karen A., 4,450,177, Cl. 426-19.000.

Dey, Arabinda N.; and Holmes, Robert W., to Duracell Inc. Cell having improved abuse resistance. 4,450,213, Cl. 429-105.000.

Diamand, Felix, to Thomson-CSF. Electronic control variable phase shift device comprising a long gate field effect-transistor and a circuit using such a device. 4,450,372, Cl. 307-511.000.

Diamond Shamrock Chemicals Company: *See*—
Drake, Nancy J.; Hilston, Michael D.; and O'Malley, Mary A., 4,450,262, Cl. 526-234.000.

Diamond Shamrock Corporation: *See*—
Gestaut, Lawrence J., 4,450,187, Cl. 427-125.000.

Dibrell, Edwin W., to Centrifugal Piston Expander Inc. Method and apparatus for extracting heat and mechanical energy from a pressured gas. 4,449,379, Cl. 62-401.000.

Dickinson, Robert V. C., to E-Com Corporation. Tamper-resistant, expandable communications system. 4,450,481, Cl. 358-114.000.

Diery, Helmut; Deubel, Reinhold; and Weide, Joachim, to Hoechst Aktiengesellschaft. Polyether dispersants. 4,450,304, Cl. 568-609.000.

Diesel Kiki Company, Ltd.: *See*—
Kawatei, Hisatsugu; Saito, Hidetoshi; and Nakamura, Hisashi, 4,449,500, Cl. 123-380.000.

Dieter Graesslin Feinwerktechnik: *See*—
Kammerer, Gerd, 4,449,832, Cl. 368-187.000.

Dietrick, Earl T.; and Prayner, Timothy F., to Townmotor Corporation. Contact tip for a welding head. 4,450,341, Cl. 219-137.520.

Dietz, Ernest W.: *See*—
Carmo, Robert A.; and Dietz, Ernest W., 4,449,776, Cl. 339-91.00R.

Digital Equipment Corporation: *See*—
Stewart, Robert E.; Buzynski, John E.; and Giggi, Robert, 4,450,572, Cl. 375-87.000.

Dimter GmbH Maschinenfabrik: *See*—
Wiegand, Karl-Wolfram, 4,449,558, Cl. 144-367.000.

Disclaire, Jacques; and Mignotte, Claude, to Societe de Pariset du Rhone S.A. Process for making a winding for a low-power alternator stator. 4,449,288, Cl. 29-596.000.

Discovision Associates: *See*—
Golding, Scott M., 4,450,488, Cl. 358-342.000.

Dittmann, Fred M., Jr., to Municipal Industries, Inc. Rear suspension and storage box for a three-wheel motorcycle. 4,449,602, Cl. 180-215.000.

DiTullio, Flavia, to Consolidated Foods Corporation. Brassiere. 4,449,533, Cl. 128-494.000.

Ditzer, Joseph R., Jr., to Eastman Kodak Company. Dye compositions containing partially hydrolyzed polyvinyl ester. 4,449,985, Cl. 8-528.000.

Dr. Ing. h.c.F. Porsche AG: *See*—
Eger, Georg, 4,449,749, Cl. 296-194.000.
Langwieder, Rolf; Rebmann, Rolf; Stotz, Erich; Wierschem, Franz-Rudolf; and Trick, Fred, 4,449,603, Cl. 180-232.000.

Dodd, Frederick H., to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the. Eyepiece for protective devices. 4,449,255, Cl. 2-428.000.

Dodd, Joseph C. Apparatus for removing excess liquid and contaminants from belt filter cake. 4,450,080, Cl. 210-391.000.

Dodd, Ned T. Poultry conveyor. 4,449,626, Cl. 198-765.000.

Dodich, James, to Levolor Lorentzen, Inc. Ceiling panel and lens. 4,449,344, Cl. 52-475.000.

Doerer, Daniel M., to Brown Group, Inc. Method of fixturing shoe component. 4,450,130, Cl. 264-154.000.

Doljack, Frank A.; and Middleman, Lee M., to Raychem Corporation. Protection of certain electrical systems by use of PTC device. 4,450,496, Cl. 361-58.000.

Dolland, Carlisle R., to Garrett Corporation, The. Position transducer for digital systems. 4,450,443, Cl. 340-870.360.

Domesle, Rainer; Volker, Herbert; Koberstein, Edgar; and Pletka, Hans-Dieter, to Degussa Aktiengesellschaft. Catalyst for the combustion of harmful substances contained in exhaust gases of internal combustion engines operated with alcohol and process for the production of the catalyst. 4,450,244, Cl. 502-185.000.

Don Fell Limited: *See*—
Takeuchi, Seiji, 4,449,279, Cl. 29-401.100.

Donehoo, Robert F.: *See*—
Castleman, B. Wayne; Donehoo, Robert F.; Oswald, Rudolph G.; Reed, Kenneth L.; and Shipley, George H., 4,450,409, Cl. 324-460.000.

Donomoto, Tadashi; Tanaka, Atsuo; Tatematsu, Yoshiaki; and Akai, Tsugio, to Toyota Jidosha Kabushiki Kaisha. Fiber reinforced metal type composite material with high purity aluminum alloy containing magnesium as matrix metal. 4,450,207, Cl. 428-614.000.

Dooley, James H., to Weyerhaeuser Company. Seed planter. 4,449,642, Cl. 221-211.000.

Dorfman, Mitchell R.: *See*—
Longo, Frank N.; Bader, Nicholas F., III; and Dorfman, Mitchell R., 4,450,184, Cl. 427-34.000.

Dorr-Oliver Incorporated: *See*—
Leon, Albert M.; and McCoy, Daniel E., 4,449,482, Cl. 122-4.00D.

Dotsenko, Taras P.: *See*—
Orlov, Naum Y.; and Dotsenko, Taras P., 4,449,754, Cl. 299-21.000.

Dow Chemical Company, The: *See*—
Hefner, Robert E., Jr., 4,450,070, Cl. 209-3.000.
Pawloski, Chester E.; and Ginter, Sally P., 4,450,280, Cl. 549-221.000.
Woo, Edmund P.; and Murray, Daniel J., 4,450,285, Cl. 560-206.000.

Dow Corning Corporation: *See*—
Baney, Ronald H., 4,450,255, Cl. 524-430.000.
Groenhof, Eugene D., 4,449,415, Cl. 74-214.000.

Downs Surgical Limited: *See*—
Bevan, David R.; and Layman, Jeremy, 4,449,970, Cl. 604-333.000.

Draft Systems, Inc.: *See*—
Fallon, Merton R.; and Clements, Thomas W., 4,449,412, Cl. 73-738.000.

Dragerwerk A.G.: *See*—
Baum, Marcel, 4,449,522, Cl. 128-200.260.

Drake, Charles A., to Phillips Petroleum Company. Process for the oxidation of secondary-alkyl substituted benzenes. 4,450,303, Cl. 568-574.000.

Drake, Cyril F.; and Brocklehurst, John R., to ITT Industries, Inc. Glass encapsulated materials. 4,449,981, Cl. 604-890.000.

Drake, Nancy J.; Hilston, Michael D.; and O'Malley, Mary A., to Diamond Shamrock Chemicals Company. Hydrophilic copolymer compositions useful as contact lenses. 4,450,262, Cl. 526-234.000.

Draloric Electronic GmbH: *See*—
Wollenschlager, Werner, 4,450,500, Cl. 361-277.000.

Draper, Robert; Lackey, Robert S.; Fagan, Thomas J., Jr.; Veyo, Stephen E.; and Humphrey, Joseph R., to Westinghouse Electric Corp. Indoor unit for electric heat pump. 4,449,376, Cl. 62-259.100.

Draper, Robert, to Westinghouse Electric Corp. Thermosyphon coil arrangement for heat pump outdoor unit. 4,449,377, Cl. 62-324.100.

Drechsel, Arno. Impact irrigators in general. 4,449,668, Cl. 239-230.000.

Drechsler, Mark A.; and Hutchins, Walter J., to Stanley Works, The. Power returnable coilable rule with improved blade locking assembly. 4,449,302, Cl. 33-138.000.

Dreiseitl, Walter; Koch, Manfred; and Linden, Wilhelm, to Siemens AG. Method and apparatus for determining rotational speed. 4,450,403, Cl. 324-166.000.

Dresser Industries, Inc.: *See*—
Blackwell, Henry W., 4,449,736, Cl. 285-3.000.

Dreyer, Stephen F.: *See*—
Hoff, Marcian E., Jr.; Townsend, Marshall A.; and Dreyer, Stephen F., 4,450,365, Cl. 307-262.000.

Dreyer, Volker: *See*—
Franz, Han-Jurgen; and Dreyer, Volker, 4,449,405, Cl. 73-304.00C.

Drutchas, Gilbert H., to TRW Inc. Fuel supply system. 4,449,506, Cl. 123-458.000.

Du, Mila T.; and Shepherd, Robert G., to American Cyanamid Company. Antiatherosclerotic 1-piperazine-thicarboxamides. 4,450,272, Cl. 544-357.000.

Dubrous, Francis: *See*—
Herold, Robert; and Dubrous, Francis, 4,450,003, Cl. 75-10.00R.

Dudek, David M.; and Lambert, Mark A., to Pfizer, Inc. Calcium-/aluminum alloys and process for their preparation. 4,450,136, Cl. 420-590.000.

Dudzinski, Zdzislaw W.: *See*—
Green, Harold A.; Petrocci, Alfonso N.; and Dudzinski, Zdzislaw W., 4,450,174, Cl. 424-329.000.

Duggan, George L.: *See*—
Kendrick, George B.; Duggan, George L.; and Ochoa, Carlos, 4,450,381, Cl. 313-579.000.

Duke, June T.: *See*—
Isley, Ralph E.; Prem, Dorothy C.; and Duke, June T., 4,450,254, Cl. 524-399.000.

Dundon, Gerard M. High output, long duration, quick response, radiant electrical heater. 4,450,343, Cl. 219-357.000.

Dunn, Ralph; and Coleman, Leonard R., to Mattel, Inc. Method of making miniature doll heads. 4,450,129, Cl. 264-132.000.

Du Pont de Nemours, E. I., and Company: *See*—
Lee, Jerald D., 4,449,821, Cl. 356-319.000.
Wreford, Stanley S., 4,450,112, Cl. 260-410.90R.
Yoo, Sung-eun, 4,450,172, Cl. 424-309.000.

Duracell Inc.: *See*—
Dey, Arabinda N.; and Holmes, Robert W., 4,450,213, Cl. 429-105.000.

Durkee, Richard G. Heavy metal removal process. 4,450,002, Cl. 75-0.50A.

Dusing, Wolfgang: *See—*
Roder, Eberhard, deceased; Borchers, Hans-Dieter, administrator; and Dusing, Wolfgang, 4,449,651, Cl. 222-455.000.

Dutton, Daniel R.: *See—*
Kaneko, Thomas M.; Dutton, Daniel R.; and Kim, Bongsub, 4,450,001, Cl. 71-118.000.

Dyckerhoff & Widmann Aktiengesellschaft: *See—*
Langwadt, Otmar, 4,449,855, Cl. 405-260.000.

Dynamit Nobel Aktiengesellschaft: *See—*
Christmann, Wolfgang; Lindner, Gerhard; and Lingens, Paul, 4,450,124, Cl. 264-3.00R.

E-Com Corporation: *See—*
Dickinson, Robert V. C., 4,450,481, Cl. 358-114.000.

E. N. I. Ente Nazionale Idrocarburi: *See—*
Vitobello, Vincenza; Branduzzi, Paolo; and Cimini, Nadia, 4,450,238, Cl. 435-256.000.

E. P. Remy et Cie: *See—*
Lemaire, Didier; and Lebret, Gerard, 4,449,624, Cl. 198-412.000.

E. R. Wagner Mfg. Co.: *See—*
Schnuell, Henry A., 4,449,268, Cl. 16-35.00R.

Earle M. Jorgensen Co.: *See—*
Andreini, Rockne J.; Farmer, Audley J.; and Yaguchi, Svetlana, 4,450,008, Cl. 75-128.00A.

Eastman, Alan D.; and Kimble, James B., to Phillips Petroleum Company. Oxidative dehydrogenation of paraffins. 4,450,313, Cl. 585-624.000.

Eastman Kodak Company: *See—*
Detty, Michael R.; and Perlstein, Jerome H., 4,450,217, Cl. 430-58.000.
Ditzer, Joseph R., Jr., 4,449,985, Cl. 8-528.000.
Fletcher, George L.; and Wadsworth, Donald H., 4,450,093, Cl. 252-182.000.
Fulmer, George G.; and Lawson, John R., 4,450,216, Cl. 430-31.000.
Klein, Gerald W.; Snow, Robert A.; and Sutton, Richard C., 4,450,224, Cl. 430-213.000.
Mattes, Kenneth C.; and Warren, Harold C., 4,450,222, Cl. 430-220.000.
McConnell, Richard L.; Meyer, Max F., Jr.; and Petke, Frederick D., 4,450,250, Cl. 524-141.000.
Reithel, Raymond F.; and Weiss, Armin K., 4,450,215, Cl. 430-7.000.
Sanford, Karl J.; Sutherland, John W.; and Eikenberry, Jon N., 4,450,232, Cl. 435-15.000.

Eastwood, H. Keith: *See—*
Lightstone, Alexander W.; Eastwood, H. Keith; and Szarka, Frank, 4,449,781, Cl. 350-96.150.

Eaton Corporation: *See—*
Jones, William H., 4,449,384, Cl. 68-12.00R.
Kaiser, Hermann; and Olson, Jerry A., 4,449,401, Cl. 73-202.000.

Ebbing, Steven J.; and Hermans, Robert J., to Sundstrand Corporation. Hydraulic valve control and feedback utilizing a harmonic drive differential. 4,449,442, Cl. 91-44.000.

Eckardt AG: *See—*
Bader, Horst, 4,449,546, Cl. 137-86.000.

Ecton Corp.: *See—*
Smolinski, Ronald E., 4,449,899, Cl. 418-255.000.

Eder, Herbert, to Knorr-Bremse GmbH. Service brake accelerator for rail vehicle air brake systems. 4,449,759, Cl. 303-38.000.

Edmundson, H. Dale: *See—*
Tucker, Jeffrey C.; Edmundson, H. Dale; Wigley, David L.; and Vallo, Mark F., 4,449,393, Cl. 73-40.000.

Egawa, Setsuya; and Sakamoto, Masahiro, to Jujo Paper Co., Ltd. Process for producing microcapsules. 4,450,123, Cl. 264-4.700.

Egawa, Takeshi: *See—*
Miki, Yukio; and Egawa, Takeshi, 4,449,807, Cl. 354-195.100.

Eger, Georg, to Dr. Ing. h.c.F. Porsche AG. Passenger car body end wall. 4,449,749, Cl. 296-194.000.

Egg, Max: *See—*
Fuhrer, Egon; Kleinert, Dieter; Pfrogner, Gerd; and Egg, Max, 4,449,691, Cl. 251-85.000.

Eggenstein, Friedrich: *See—*
Terhorst, Gunter; Plester, Karl-Heinz; Rosenberg, Harry; and Eggenstein, Friedrich, 4,449,859, Cl. 405-291.000.

Egly, Robert A.; and Sullivan, Patrick. Magnetic disk storage case. 4,449,628, Cl. 206-45.180.

Eiermann, Kurt; Horlebein, Eberhard; Lissmann, Kurt; and Schafer, Wolfgang, to Degussa Aktiengesellschaft. Apparatus for measuring the flow velocity of gases and liquids. 4,449,402, Cl. 73-204.000.

Eikenberry, Jon N.: *See—*
Sanford, Karl J.; Sutherland, John W.; and Eikenberry, Jon N., 4,450,232, Cl. 435-15.000.

Eilers, Norbert; and Bragas, Peter, to Blaupunkt-Werke GmbH. FM Receiver for reception of special announcements and general programs. 4,450,589, Cl. 455-205.000.

Elam, James O. Mask breathing system. 4,449,526, Cl. 128-206.210.

Electrodyne Research Corporation: *See—*
Strohmeyer, Charles, Jr., 4,449,483, Cl. 122-4.00D.

Elf France: *See—*
Lerouge, Andre; Andre, Jean-Louis; and Coutin, Pierre, 4,449,920, Cl. 431-91.000.

Eli Lilly and Company: *See—*
Lunn, William H. W., 4,450,270, Cl. 544-24.000.

Elleman, Daniel D.: *See—*
Wang, Taylor G.; Elleman, Daniel D.; and Kendall, James M., Jr., 4,449,901, Cl. 425-6.000.

Ellingson, Gary L.; and Miller, Wendell E., to Polar Research, Inc. Antenna tower assembly. 4,450,450, Cl. 343-758.000.

Elliott, Robert D.: *See—*
Temple, Carroll G., Jr.; Montgomery, John A.; Elliott, Robert D.; and Wheeler, Glynn P., 4,450,160, Cl. 424-250.000.

Ellis, Daniel M.: *See—*
Dean, Donald H.; and Ellis, Daniel M., 4,450,235, Cl. 435-253.000.
Dean, Donald H.; and Ellis, Daniel M., 4,450,236, Cl. 435-253.000.

Elsner, Burckhard: *See—*
Becker, Kunibert; Elsner, Burckhard; and Kirchbrucher, Rudiger, 4,449,860, Cl. 405-293.000.

Elsner, Georg; and Hack, Hermann, to Hoechst Aktiengesellschaft. Process for making alkali metal hypophosphite solutions. 4,450,147, Cl. 423-304.000.

Elxsi: *See—*
Holbert, Kenneth W.; and Massey, Edwin M., 4,450,029, Cl. 156-250.000.

Emco Wheaton (International) Limited: *See—*
Young, Colin G., 4,449,509, Cl. 123-527.000.

Emerson Electric Co.: *See—*
Karaktin, Vincent M., 4,449,687, Cl. 248-225.200.

Endo, Juro: *See—*
Yamaguchi, Kazuo; Kuni, Asahiro; Akiyama, Nobuyuki; and Endo, Juro, 4,449,818, Cl. 356-237.000.

Endres, Robert: *See—*
Messer, Dieter; Wilhelm, Volker; Endres, Robert; and Heine, Heinrich, 4,450,012, Cl. 106-300.000.

Endress u. Hauser GmbH u. Co.: *See—*
Franz, Han-Jurgen; and Dreyer, Volker, 4,449,405, Cl. 73-304.00C.

Energy 2000, Inc.: *See—*
Klepper, Robert; and Bomar, Daryld W., 4,449,896, Cl. 417-399.000.

Engelhard Corporation: *See—*
Feigenbaum, Haim; Pudick, Sheldon; and Singh, Rajindar, 4,450,212, Cl. 429-35.000.

Engels, Walter, to Milliken Research Corporation. Method for smoothing and brushing pile fabric. 4,449,276, Cl. 26-2.00R.

Enlow, William P.: *See—*
Hechenbleikner, Ingenuin; Enlow, William P.; and Lankin, David C., 4,450,113, Cl. 260-439.00R.

Enoxy Chimica, S.p.A.: *See—*
Roggero, Arnaldo; Bruzzone, Mario; and Gandini, Alberto, 4,450,259, Cl. 526-173.000.

Ensco, Inc.: *See—*
Kenyon, Stephen C.; Simkins, Laura J.; Brown, Leroy L.; and Sebastian, Richard, 4,450,531, Cl. 364-604.000.

Enterprises Buzzichelli: *See—*
Buzzichelli, Lilian; and Roy, Kleber, 4,449,634, Cl. 212-196.000.

Envirosonics, Inc.: *See—*
Linde, Ronald K., 4,450,141, Cl. 422-225.000.

Envirotech Corporation: *See—*
Black, Brent C.; Bradley, Bruce D.; and Haymore, Ralph B., 4,450,077, Cl. 210-275.000.

Epson Corporation: *See—*
Arai, Kenichiro, 4,449,835, Cl. 400-161.000.
Koto, Haruhiko, 4,450,454, Cl. 346-140.00R.

Equifab, Inc.: *See—*
Bergeron, Willard, 4,449,993, Cl. 55-379.000.

Erhardt, Paul W.; and Borgman, Robert J., to American Hospital Supply Corporation. Compounds and method for treatment or prophylaxis of cardiac disorders. 4,450,173, Cl. 424-309.000.

Erickson, John W.: *See—*
Peterson, Daniel G.; Erickson, John W.; and Robinson, Horace M., 4,449,582, Cl. 166-64.000.

Eriguchi, Yukio: *See—*
Okamura, Kouichi; Eriguchi, Yukio; Hagio, Katsushige; and Yamamoto, Setsuo, 4,449,662, Cl. 229-49.000.

Erpelding, Jean, to Arbed S.A. Method and apparatus for sampling or measuring a parameter of a metal melt. 4,449,700, Cl. 266-79.000.

Erwin Sick GmbH Optik-Elektronik: *See—*
Krause, Gerhard, 4,449,819, Cl. 356-300.000.
Ross, Dieter; and Ostertag, Klaus, 4,450,359, Cl. 250-572.000.

Eskamani, Abolghassem; Dernar, Helen D.; and Bartoszek-Loza, Rosemary, to Standard Oil Company, The. Photochemical decarboxylation of a metal salt of an alpha-hydroxy carboxylic acid. 4,450,059, Cl. 204-158.00R.

Eskinazi, Victoria, to Air Products and Chemicals, Inc. Selective catalytic alkylation of phenols to alkyl aryl ethers. 4,450,306, Cl. 568-630.000.

Esselte Pendaflex Corporation: *See—*
Volk, Heinrich, 4,450,036, Cl. 156-384.000.

Esser, Wilhelm C. J.; and van den Nosterum, Adrianus, to AMP Incorporated. Low insertion force connector. 4,449,773, Cl. 339-59.00M.

Essex Group, Inc.: *See—*
Saunders, Hollis S.; Carmer, Richard V.; and Payette, Lionel J., 4,449,290, Cl. 29-596.000.

Ethicon, Inc.: *See—*
Bendel, Lee P.; and Sardelis, Timothy, 4,449,530, Cl. 128-325.000.
Cerwin, Robert J.; Joshi, Madhusudan; Menges, John R.; Mericle, Robert W.; and Zwaskis, William J., 4,449,531, Cl. 128-325.000.

Ethyl Molded Products Company: *See—*
Karkiewicz, Kenneth G., 4,449,827, Cl. 366-131.000.

Eto, Goro; Nishimuro, Atsushi; and Fukuda, Noriyoshi, to Futaba Denshi Kogyo K.K. Method of manufacturing a flat-type fluorescent display tube. 4,449,949, Cl. 445-24.000.

Eto, Hiromichi; Kohmoto, Teruo; Kouda, Tadayuki; Ogawa, Youichiro; Sato, Susumu; Kuraishi, Tadayuki; and Nakashima, Toshiaki, to SS Pharmaceutical Co., Ltd. Thiazinobenzimidazole derivatives. 4,450,109, Cl. 260-243.300.

Ettema, Ernst; Benraad, Coenraad J. B. M.; and Roskam, Klaas, to Wavin B.V. Plastic crate or tray with slide wall injection molding points. 4,450,132, Cl. 264-328.800.

Eurotool B.V.: *See*—
van den Brink, Anthonie, 4,449,915, Cl. 425-564.000.

Evans, Rowland M., to Aviation Electric Ltd. Stall detector and surge prevention feature for a gas turbine engine. 4,449,360, Cl. 60-39.281.

Everitt, Delmar K.: *See*—
Goldfarb, Adolph E.; and Everitt, Delmar K., 4,449,665, Cl. 238-10.00R.

Exxon Research and Engineering Co.: *See*—
Brannon, Judeth H.; and Schorfheide, James J., 4,449,991, Cl. 55-73.000.
Lisi, Edward L.; Melleby, Juul A.; and Andersson, Arne, 4,449,569, Cl. 165-1.000.
Oswald, Alexis A.; Jermansen, Torris G.; Westner, Andrew A.; and Huang, I-Der, 4,450,299, Cl. 568-454.000.
Stone, John B.; and Floyd, Frank M., 4,450,066, Cl. 208-8.0LE.

Fagan, Thomas J., Jr.: *See*—
Draper, Robert; Lackey, Robert S.; Fagan, Thomas J., Jr.; Veyo, Stephen E.; and Humphrey, Joseph R., 4,449,376, Cl. 62-259.100.

Fahey, Patrick. Roof framing system. 4,449,335, Cl. 52-90.000.

Fahmy, Mohamed A. H., to FMC Corporation. S-Tertiary alkyl phosphoroamidodithioate pesticides. 4,450,158, Cl. 424-220.000.

Fairchild Industries, Inc.: *See*—
McComas, Jean, 4,449,679, Cl. 244-118.200.

Fakler, Bernhard: *See*—
Frister, Manfred; and Fakler, Bernhard, 4,450,389, Cl. 318-140.000.

Fallon, Merton R.; and Clements, Thomas W., to Draft Systems, Inc. Safety pressure gage. 4,449,412, Cl. 73-738.000.

Fansler, John D.: *See*—
Degnan, William G.; and Fansler, John D., 4,449,446, Cl. 92-146.000.

Farmer, Audley J.: *See*—
Andreini, Rockne J.; Farmer, Audley J.; and Yaguchi, Svetlana, 4,450,008, Cl. 75-128.00A.

Farmer, Mark: *See*—
Wolf, Ronald J.; Jereb, Richard F.; and Farmer, Mark, 4,449,497, Cl. 123-335.000.

Farr, Andrew F., to IMED Corporation. Cassette for providing a controlled flow of fluid. 4,450,079, Cl. 604-152.000.

Fegley, Charles R.: *See*—
Abraham, Bruce C.; Fegley, Charles R.; and Hurst, Jerry C., 4,449,282, Cl. 29-467.000.

Feigenbaum, Haim; Pudick, Sheldon; and Singh, Rajindar, to Engelhard Corporation. Edge seal for a porous gas distribution plate of a fuel cell. 4,450,212, Cl. 429-35.000.

Feldman, Julian, to National Distillers and Chemical Corporation. Process for recovering oxygenated organic compounds from dilute aqueous solutions employing solid sorbent. 4,450,294, Cl. 562-608.000.

Ferguson, Arthur R., to Outboard Marine Corporation. Outboard motor mounting arrangement. 4,449,945, Cl. 440-53.000.

Ferguson, Larry W.: *See*—
Hager, Thomas P.; and Ferguson, Larry W., 4,450,197, Cl. 428-232.000.

Ferranti plc: *See*—
Bell, Howard T., 4,450,585, Cl. 455-135.000.

F'Geppert, Erwin, to United States of America, Army. Segmented clutch plates. 4,449,621, Cl. 192-70.130.

Fiala, Ernst, to Volkswagenwerk Aktiengesellschaft. Engine with automatic cut-off device. 4,449,495, Cl. 123-198.0DB.

Fiala, Ernst; Schael, Fritz; and Schoedder, Reiner, to Volkswagenwerk Aktiengesellschaft. Utility vehicle body. 4,449,748, Cl. 296-183.000.

Fiber Controls Corporation: *See*—
Cash, Leonard D., 4,449,272, Cl. 19-105.000.

Fieldhouse, John W., to Firestone Tire & Rubber Company, The. Contact adhesive and adhesive system for EPDM and related elastomers. 4,450,252, Cl. 524-353.000.

Filhol, Stuart J. Package for dental tools. 4,449,630, Cl. 206-369.000.

Filipovitch, Anthony J.; and Bleuenstein, Julius M., to Ford Motor Company. Foundry sand reclamation. 4,449,566, Cl. 164-5.000.

Filstein, Eugene L.: *See*—
Barishpolsky, Boris M.; and Filstein, Eugene L., 4,450,430, Cl. 340-904.000.

Filterwerk Mann & Hummel GmbH: *See*—
Kopec, Eduard; and Oberknapp, Wolfgang, 4,449,493, Cl. 123-196.00A.

Finke, Harry P., to Bloom Engineering Company, Inc. Reheat furnace drop out door seal. 4,449,922, Cl. 432-64.000.

Finkelstein, Sam D., to MPL, Inc. Tamper-resistant pharmaceutical vial and cap assembly. 4,449,640, Cl. 220-270.000.

Finlayson, Claude M., to NL Industries, Inc. Organophilic clay gellant having enhanced dispersibility. 4,450,095, Cl. 252-315.200.

Finley, Thomas E.: *See*—
Steensma, Peter D.; Weinberg, Murray; Smid, Robert W.; and Finley, Thomas E., 4,450,554, Cl. 370-4.000.

Finnegan, Robert D.: *See*—
Tauber, Arthur; Finnegan, Robert D.; and Rothwarf, Frederick, 4,449,952, Cl. 445-55.000.

Firestone Tire & Rubber Company, The: *See*—
Fieldhouse, John W., 4,450,252, Cl. 524-353.000.

Firmagroup Australia Pty. Ltd.: *See*—
Leivenzon, Simon; and Leivenzon, Steven, 4,449,562, Cl. 160-113.000.

Fischer, Lothar; Hausen, Manfred Z.; and Wember, Kurt, to Chemische Werke Huels Aktiengesellschaft. Process for the continuous manufacture of n-butyraldehyde by selective hydrogenation of crotonaldehyde in the liquid phase in the presence of a palladium-aluminum oxide catalyst. 4,450,300, Cl. 568-462.000.

Fischer, Rudolf; Kunzle, Franz M.; and Schmutz, Jean, to Sandoz Ltd. Pyrrolobenzotriazepines. 4,450,108, Cl. 260-243.300.

Fisher, David R., to Zee Toys, Inc. Adjustable spinning toy vehicle. 4,449,323, Cl. 46-211.000.

Flannigan, Jerry E., to St. Regis Paper Company. Bulk material container. 4,449,649, Cl. 222-181.000.

Fletcher, George L.; and Wadsworth, Donald H., to Eastman Kodak Company. Indolizinone dyes and compositions, elements and methods using same. 4,450,093, Cl. 252-182.000.

Flonic S.A.: *See*—
Leti, Roland, 4,449,410, Cl. 73-861.910.

Floreancig, Antoine; Siffert, Bernard; and Trescol, Jean-Jacques, to Pechiney. Process for reducing the organic solvent losses in the treatment of a suspension resulting from the acid attack on an ore. 4,450,143, Cl. 423-10.000.

Flowcon Oy: *See*—
Forss, Bengt, 4,450,106, Cl. 260-124.00R.

Floyd, Frank M.: *See*—
Stone, John B.; and Floyd, Frank M., 4,450,066, Cl. 208-8.0LE.

FMC Corporation: *See*—
Fahmy, Mohamed A. H., 4,450,158, Cl. 424-220.000.
Hill, Jerry M.; and Lipe, Joel T., 4,450,529, Cl. 364-508.000.
Peake, Clinton J.; Harnish, Wayne N.; and Davidson, Bruce L., 4,450,269, Cl. 544-8.000.

Foerster, Michael: *See*—
Kocher, Jakob; and Foerster, Michael, 4,449,797, Cl. 351-205.000.

Fogg, Walter K. Garment. 4,449,254, Cl. 2-407.000.

Fohl, Artur, to REPA Feinstanzwerk GmbH. Cylinder/piston drive, especially for retightener systems in automatic safety belt winding devices. 4,449,443, Cl. 91-392.000.

Fohlen, George M.: *See*—
Achar, Bappalige N.; Fohlen, George M.; and Parker, John A., 4,450,268, Cl. 528-327.000.

Folkmann, Andrew F., to Rockwell International Corporation. Feed forward circuit. 4,450,417, Cl. 333-24.00R.

Forbus, Nancy P.; and Wu, Margaret M., to Mobil Oil Corporation. Process for light olefin production. 4,449,961, Cl. 585-640.000.

Ford Motor Company: *See*—
Boaz, Premakaran T., 4,450,346, Cl. 219-522.000.
Carriere, Donald L., 4,449,423, Cl. 74-688.000.
Filipovitch, Anthony J.; and Bleuenstein, Julius M., 4,449,566, Cl. 164-5.000.
Janssen, Lutz J.; and Le Quement, Patrick, 4,449,796, Cl. 350-582.000.
Meitzler, Allen H., 4,450,376, Cl. 310-334.000.
Rhodes, Eugene E., 4,449,692, Cl. 251-144.000.

Forestier, Alexandre; Pluquet, Alain A.; Rosa, Roger A.; Tabet, Mansour; and Teysseyre, Pierre M., to S.N.E.C.M.A. Soundproofing for a gas pipe, in particular for the fan jet of a turbojet, and equipment for its fabrication. 4,449,607, Cl. 181-213.000.

Forni, William J. Interproximal dental stimulator and cleaning apparatus. 4,449,933, Cl. 433-141.000.

Forss, Bengt, to Flowcon Oy. Lignin product for lowering the viscosity of cement and other finely-divided mineral material suspensions. 4,450,106, Cl. 260-124.00R.

Forster, Franz, to Linde Aktiengesellschaft. Axial piston pumps. 4,449,444, Cl. 91-506.000.

Forster, Heinz; and Priesnitz, Uwe, to Bayer Aktiengesellschaft. Process for the preparation of trifluoromethylphenyl oxyphenyl ether compounds. 4,450,308, Cl. 568-637.000.

Fory, Werner; Martin, Henry; and Pissiotas, Georg, to Ciba-Geigy Corporation. Oxime derivatives for protecting plant crops. 4,450,000, Cl. 71-105.000.

Foss, Morten; and Strandli, Kaare R., to A/S Raufoss Ammunisjonsfabrikker. Safety device for a projectile. 4,449,456, Cl. 102-240.000.

Foster Wheeler Energy Corporation: *See*—
Schroeder, Joseph W., 4,449,280, Cl. 29-421.00E.
Trozzi, Norman K., 4,450,071, Cl. 209-144.000.

Fournex, Robert: *See*—
Christidis, Yani; and Fournex, Robert, 4,450,292, Cl. 562-463.000.

Fox, Joseph R.; Curatolo, Benedict S.; and Pesa, Frederick A., to Standard Oil Company, The. Conversion of methane to olefins and hydrogen. 4,450,310, Cl. 585-400.000.

Fraden, Jacob, to Bio/Optical Sensor Partners, Ltd. Motion discontinuance detection system and method. 4,450,351, Cl. 250-221.000.

Francis, John F., to Gillette Company, The. Method of manufacturing razor blade assemblies. 4,449,428, Cl. 76-104.00R.

Franco, Simone: *See*—
Delfino, Gerolamo; and Franco, Simone, 4,450,230, Cl. 430-539.000.

Frank, Joseph J.: *See*—
Miller, William H.; and Frank, Joseph J., 4,450,373, Cl. 310-51.000.

Franken, Adrianus; J. J.; and Hagen, Johannes L. M., to U.S. Philips Corporation. Aerostatic axial thrust bearing. 4,449,834, Cl. 384-99.000.

Frankenberg, Alfred A.; and Scott, Douglas R., to Robertshaw Controls Company. Exhaust system for an internal combustion engine, burn-off unit and methods therefor. 4,449,362, Cl. 60-274.000.

Franz, Han-Jurgen; and Dreyer, Volker, to Endress u. Hauser GmbH u. Co. Rod-like probe for the capacitive measurement of the level in a container. 4,449,405, Cl. 73-304.00C.

Fredrick, Edmund R.: *See*—
Hales, Harvey E.; and Fredrick, Edmund R., 4,449,666, Cl. 238-84.000.

Freitag, Dieter: *See*—
Idel, Karsten; Freitag, Dieter; and Merten, Josef, 4,450,266, Cl. 524-265.000.
Schmidt, Manfred; Wank, Joachim; Reese, Eckart; Freitag, Dieter; Wangermann, Klaus; and Cohnen, Wolfgang, 4,450,249, Cl. 524-132.000.

Frey-Wigger, Paul. Working platform. 4,449,611, Cl. 182-63.000.

Friedli, Hans: *See*—
Merz, Walter; and Friedli, Hans, 4,450,053, Cl. 204-67.000.

Frister, Manfred; and Fakler, Bernhard, to Robert Bosch GmbH. Vehicular-type generator and forced air cooling blower combination. 4,450,389, Cl. 318-140.000.

Fritzvold, Bjorn H.; and Soteland, Nicolai, to Myrens Verksted A/S. Method for bleaching oxygen delignified cellulose-containing pulp with ozone and peroxide. 4,450,044, Cl. 162-65.000.

Fuchs, Dorothy J.; and Fuchs, Francis J., Jr. Clipping apparatus. 4,449,297, Cl. 30-29.000.

Fuchs, Francis J., Jr.: *See*—
Fuchs, Dorothy J.; and Fuchs, Francis J., Jr., 4,449,297, Cl. 30-29.000.

Fuehrer, Reece R.; and Hess, Richard L., to General Motors Corporation. Transmission center support mounting. 4,449,422, Cl. 74-606.00R.

Fuhrer, Egon; Kleinert, Dieter; Pfrogner, Gerd; and Egg, Max. Electromagnet. 4,449,691, Cl. 251-85.000.

Fuhrer, Rudolf: *See*—
Liebhardt, Josef; Fuhrer, Rudolf; and Dautel, Erich, 4,449,454, Cl. 102-226.000.

Fuji Jukogyo Kabushiki Kaisha: *See*—
Sakakiyama, Ryuzo; and Takano, Toshio, 4,449,617, Cl. 192-0.033.
Sakakiyama, Ryuzo, 4,449,619, Cl. 192-0.052.
Sakakiyama, Ryuzo, 4,449,620, Cl. 192-0.052.

Fuji Photo Film Co., Ltd.: *See*—
Horie, Seiji; Nakano, Junji; and Sato, Hideo, 4,450,219, Cl. 430-59.000.
Nishizawa, Jun-ichi; Ohmi, Tadahiro; and Matsumoto, Seiji, 4,450,466, Cl. 357-30.000.
Oshikoshi, Yuji; and Agano, Toshitaka, 4,450,485, Cl. 358-298.000.
Tadokoro, Eiichi; Fujiyama, Masaaki; and Akashi, Goro, 4,450,199, Cl. 428-317.900.

Fuji Xerox Co., Ltd.: *See*—
Watanabe, Yutaka, 4,449,449, Cl. 101-111.000.

Fujibayashi, Kenji, to Olympus Optical Co., Ltd. Automatic signal level control device. 4,450,413, Cl. 330-279.000.

Fujii, Katsutoshi: *See*—
Kamioka, Toshiharu; Nakayama, Isao; Honda, Takeo; Kobayashi, Takashi; Obata, Tokio; Fujii, Katsutoshi; Kojima, Mikio; and Akiyoshi, Yuji, 4,450,162, Cl. 424-251.000.

Fujii, Shuzo: *See*—
Saito, Hisatoshi; Fujii, Shuzo; Takase, Itaru; Nakamura, Akihiko; and Hara, Yoshihiro, 4,449,861, Cl. 406-39.000.

Fujii, Takayoshi: *See*—
Yoshikumi, Chikao; Ohmura, Yoshio; Hirose, Fumio; Ikuzawa, Masanori; Matsunaga, Kenichi; Fujii, Takayoshi; Ohhara, Minoru; and Ando, Takao, 4,450,156, Cl. 424-180.000.

Fujii, Yasuhiko; Kikuchi, Mitsuru; and Saito, Hiroyuki, to Victor Company of Japan, Ltd. System for obtaining synchronized reproduction from a plurality of reproducing apparatuses. 4,450,490, Cl. 360-13.000.

Fujimaki, Yoshihide: *See*—
Takei, Yoshiaki; Fujimaki, Yoshihide; and Nomori, Hiroyuki, 4,450,218, Cl. 430-59.000.

Fujimori, Yoshinori: *See*—
Ando, Hideo; Nakagawa, Toshiharu; and Fujimori, Yoshinori, 4,450,452, Cl. 346-135.100.

Fujino, Shoji, to Nippon Atsudenki Kabushiki Kaisha. Automatic tuning device for FM receiver. 4,450,586, Cl. 455-161.000.

Fujioka, Yoshiki: *See*—
Kohzai, Yoshinori; Fujioka, Yoshiki; and Ota, Naoto, 4,450,393, Cl. 318-592.000.

Fujita, Taira; Nakagawa, Hiroyuki; Sugihara, Mikio; Kobayashi, Kimiyuki; and Okamoto, Katuhiko, to Sumitomo Chemical Company, Limited. Process for production of sulfuric acid semiesters. 4,450,114, Cl. 260-458.00C.

Fujita, Yasuhiro: *See*—
Itoh, Fumikazu; Fujita, Yasuhiro; Kobayashi, Takashi; and Mifune, Takao, 4,449,293, Cl. 29-736.000.

Fujitsu Fanuc Limited: *See*—
Kohzai, Yoshinori; Fujioka, Yoshiki; and Ota, Naoto, 4,450,393, Cl. 318-592.000.

Fujitsu Limited: *See*—
Meguro, Takeshi; and Ito, Yukio, 4,450,421, Cl. 333-202.000.
Nakashima, Masato; Koezuka, Tetsuo; and Inagaki, Takefumi, 4,450,579, Cl. 382-8.000.
Takemae, Yoshihiro; Nakano, Tomio; Nakano, Masao; Tsuge, Norihisa; and Ohira, Tsuyoshi, 4,450,515, Cl. 363-60.000.

Fujiwara, Hideo; Kudo, Mitsuhiro; Tamura, Teizo; Sugishita, Nobuyuki; Shiroishi, Yoshihiro; Kimura, Takeshi; Shinagawa, Kiminari; and Kumasaka, Noriyuki, to Hitachi Ltd. Magnetic head. 4,450,494, Cl. 360-125.000.

Fujiyama, Masaaki: *See*—
Tadokoro, Eiichi; Fujiyama, Masaaki; and Akashi, Goro, 4,450,199, Cl. 428-317.900.

Fukasawa, Noburu: *See*—
Seko, Yasutoshi; Yanagishima, Takayuki; and Fukasawa, Noburu, 4,450,438, Cl. 340-576.000.

Fukuda, Noriyoshi: *See*—
Eto, Goro; Nishimuro, Atsushi; and Fukuda, Noriyoshi, 4,449,949, Cl. 445-24.000.

Fukukura, Kazutoyo; and Martinez, Richard A., to AMP Incorporated. Encoded keyboard switch. 4,450,324, Cl. 200-5.00A.

Fukukura, Kazutoyo, to AMP Incorporated. Key switch assembly having momentary closed interval. 4,450,331, Cl. 200-160.000.

Fukunaga, Seiki: *See*—
Shirosaki, Tsutomu; and Fukunaga, Seiki, 4,450,279, Cl. 549-27.000.

Fulmer, George G.; and Lawson, John R., to Eastman Kodak Company. Method for improving the sensitometric response of a persistently conductive photoreceptor. 4,450,216, Cl. 430-31.000.

Furuhashi, Toshio, to Hitachi, Ltd. Control system for internal combustion engine. 4,449,502, Cl. 123-440.000.

Furuhashi, Yasuhiro; Miyata, Yukinori; and Hishinuma, Osamu, to Nippondenso Co., Ltd. Distributor type fuel injection pump. 4,449,504, Cl. 123-447.000.

Furuichi, Katsushi; and Takahata, Naomi, to Canon Kabushiki Kaisha. Paper leaf handling apparatus. 4,449,812, Cl. 355-14.0SH.

Futaba Denshi Kogyo K.K.: *See*—
Eto, Goro; Nishimuro, Atsushi; and Fukuda, Noriyoshi, 4,449,949, Cl. 445-24.000.

Gabriele, Leonard A., to Lear Siegler, Inc. Broaching machine. 4,449,872, Cl. 409-252.000.

Gagas, Michael. External manhole seal. 4,449,715, Cl. 277-12.000.

Gakko Hojin Kinki Daigaku (Educational Foundation Kinki Univ.): *See*—
Iwamura, Junichi; and Komai, Koichiro, 4,449,997, Cl. 71-88.000.

Galer, Richard E., to United States Gypsum Company. Method and apparatus for making reinforced cement board. 4,450,022, Cl. 156-42.000.

Gallagher, Paul H. Wind energy apparatus. 4,450,362, Cl. 290-55.000.

Gallaher Limited: *See*—
Adair, Noel J.; Carlisle, Robert W.; Stubbs, Michael E.; and Rooney, John J., 4,450,245, Cl. 502-211.000.

Gallina, Rolando. Method and apparatus for manufacturing foot supports with anatomically contoured shank portions. 4,450,122, Cl. 264-46.400.

Galloway, Alvin J.: *See*—
Painter, Walter C.; Luttmer, David J.; and Galloway, Alvin J., 4,450,397, Cl. 318-762.000.

Gandini, Alberto: *See*—
Roggero, Arnaldo; Bruzzone, Mario; and Gandini, Alberto, 4,450,259, Cl. 526-173.000.

Ganshirt, Karl H.: *See*—
Walker, Wolfram H.; Ganshirt, Karl H.; and Schleussner, Hans, 4,450,078, Cl. 210-315.000.

GAO Gesellschaft fur Automation und Organisation mbH: *See*—
Haghiri-Tehrani, Yahya; and Hoppe, Joachim, 4,450,024, Cl. 156-108.000.

Garcia, Gerry R. Fly exterminator. 4,449,319, Cl. 43-139.000.

Gareis, Ronald E., to General Electric Company. Contactor with flux sensor. 4,450,427, Cl. 338-32.00H.

Garnett, William A.: *See*—
McCrory, William W.; Quigley, William B.; and Garnett, William A., 4,449,473, Cl. 114-354.000.

Garrett Corporation, The: *See*—
Dolland, Carlisle R., 4,450,443, Cl. 340-870.360.

Garrett, William R. Single-acting piston pump having two heads. 4,449,897, Cl. 417-437.000.

Garvens, Dieter: *See*—
Toerner, Ludger; Garvens, Dieter; Hager, Gunter; and Rettinger, Anton, 4,449,742, Cl. 285-236.000.

Gaslonde, Jean-Pierre, to U.S. Philips Corporation. Electronic speed regulator for a d.c. motor. 4,450,392, Cl. 318-317.000.

Gau, Wolfgang: *See*—
Preiss, Michael; Gau, Wolfgang; and Behre, Horst, 4,450,297, Cl. 568-424.000.

Gaulier, Yves, to U.S. Philips Corporation. Method of manufacturing capacitors integrated in microelectronic structure. 4,450,048, Cl. 204-15.000.

Gauthier, Jean-Marc. Neck and collarbone protector. 4,449,251, Cl. 2-2.000.

Gavronsky, German, to Pitney Bowes Inc. Envelope flap sealing device. 4,450,037, Cl. 156-441.500.

Gebr. Eickhoff, Maschinenfabrik und Eisengiesserei, m.b.H.: *See*—
Hotger, Karl, 4,449,738, Cl. 285-11.000.

Gebruder Junghans GmbH: *See*—
Halssig, Andreas, 4,449,455, Cl. 102-234.000.
Halssig, Andreas, 4,449,457, Cl. 102-251.000.

Gebrueder Sucker: *See*—
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Peters, Thomas E.; Gustafson, John C.; and Wong, Boon, 4,450,135, Cl. 419-12.000.
Proad, Joseph M.; Riseberg, Leslie A.; Byszewski, Wojciech W.; and Budinger, A. Bowman, 4,450,380, Cl. 313-485.000.
Sarin, Vinod K.; and Buljan, Sergej-Tomislav, 4,449,989, Cl. 51-295.000.
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Buckinx, Pol, 4,450,420, Cl. 333-194.000.
Kendrick, George B.; Duggan, George L.; and Ochoa, Carlos, 4,450,381, Cl. 313-579.000.
Kim, Han J.; and Bevington, Richard C., 4,450,204, Cl. 428-552.000.
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Hartman, John E., to National Bulk Equipment, Inc. Tiltable platform. 4,449,880, Cl. 414-421.000.
Hartman, Louis P.: *See*—
Burbo, James H.; Hartman, Louis P.; Spranger, Douglas M.; Brookes, Malcolm J.; and Mulhauser, Paul J., 4,449,787, Cl. 350-538.000.
Hasegawa, Akira; and Sakaguchi, Katsuyoshi, to Mitsubishi Jukogyo Kabushiki Kaisha. Apparatus for loading and unloading tires for a tire vulcanizing machine. 4,449,903, Cl. 425-38.000.
Hasegawa, Akira; and Miyamoto, Yoshinori, to Mitsubishi Jukogyo Kabushiki Kaisha. Hydraulic vulcanizing press. 4,449,917, Cl. 425-149.000.
Hasegawa, Hiroshi, to Nippon Kogaku K.K. Automatic light-quantity-control speed light. 4,450,506, Cl. 362-4.000.
Hasegawa, Mitsuhiro, to Kayaba Kogyo Kabushiki Kaisha. Full extension locking device for damper. 4,449,702, Cl. 267-64.120.
Hasegawa, Toru; Izawa, Motowo; and Tanida, Seiichi. Antibiotic C-15003 PHM and production thereof. 4,450,234, Cl. 435-253.000.
Hasegawa, Toshifumi; and Kanii, Norikazu, to Toyoda Koki Kabushiki Kaisha. Machine tool with a pallet change function. 4,449,277, Cl. 29-33.00P.
Hashikawa, Kenzo: *See*—
Yaegashi, Takehisa; Aoki, Keiji; and Hashikawa, Kenzo, 4,450,528, Cl. 364-431.050.
Hashimoto, Susumu: *See*—
Ishikawa, Kiyotsugu; Sone, Yoshiaki; Hashimoto, Susumu; Omae, Masanori; and Kunii, Takao, 4,450,475, Cl. 358-44.000.
Hashimoto, Yoshiki: *See*—
Yoshino, Masataka; Hashimoto, Yoshiki; and Ushikosi, Yasunori, 4,449,574, Cl. 165-11.00R.
Haskin, Roger L.: *See*—
Hollaar, Lee A.; and Haskin, Roger L., 4,450,520, Cl. 364-200.000.
Hastings, Otis H., to Transaction Security, Inc. Data processing equipment enclosures. 4,449,764, Cl. 312-236.000.
Hatanaka, Masayuki: *See*—
Akita, Shinji; Hatanaka, Masayuki; and Uemura, Akira, 4,449,386, Cl. 72-100.000.
Hattori, Yutaka: *See*—
Ohta, Minoru; Hattori, Yutaka; Kawakami, Tomio; and Onoda, Michitosi, 4,450,428, Cl. 338-34.000.
Hauni-Werke Korber & Co. KG.: *See*—
Grieben, Karl H.; and Menge, Gunter, 4,449,625, Cl. 198-472.000.
Redeker, Werner; and Uhlig, Uwe, 4,449,988, Cl. 51-165.800.
Hausen, Manfred Z.: *See*—
Fischer, Lothar; Hausen, Manfred Z.; and Wember, Kurt, 4,450,300, Cl. 568-462.000.
Hauser, Hans, to MTD Products Inc. Multi-speed transaxle. 4,449,424, Cl. 74-701.000.
Hawe-Neos Dental Dr. H. v. Weissenfluh SA: *See*—
von Weissenfluh, Beat, 4,449,928, Cl. 433-40.000.
Hawkins, Ronald J.: *See*—
Hamill, Anthony C.; and Hawkins, Ronald J., 4,449,387, Cl. 72-215.000.
Hayakawa Rubber Company Limited: *See*—
Ishido, Yoshinobu; and Tanaka, Hideo, 4,449,713, Cl. 277-1.000.
Hayasaki, Hidehiko; and Yasumura, Motoaki, to Kabushiki Kaisha Tanaka Seisakusho. Method of controlling an operation of a copy-cutting apparatus. 4,450,014, Cl. 148-9.00R.
Hayashi, Keijiro; Awano, Toshimi; Yoshikawa, Masayuki; Yazawa, Kouzou; and Ito, Takashi, to Mizuno Corporation. Golf club head of carbon fiber reinforced plastic. 4,449,707, Cl. 273-171.000.
Hayashi, Kiyoshi: *See*—
Terasawa, Hidenori; and Hayashi, Kiyoshi, 4,449,791, Cl. 350-427.000.
Haybuster Manufacturing, Inc.: *See*—
Morlock, Ruben D.; Kopecky, Ivyl D.; Anderson, Robert R.; and Marcy, Dewey R., 4,449,672, Cl. 241-101.700.
Hayes, Roger: *See*—
Bays, David E.; and Hayes, Roger, 4,450,168, Cl. 424-267.000.
Haymore, Ralph B.: *See*—
Black, Brent C.; Bradley, Bruce D.; and Haymore, Ralph B., 4,450,077, Cl. 210-275.000.
Haynie, Timothy J., to Chicago Bridge & Iron Company. Apparatus and methods of cooling and condensing exhaust steam from a power plant. 4,449,368, Cl. 60-652.000.
Hays, Herbert G.; and Kuipers, Warren W., to Amana Refrigeration, Inc. Recuperative furnace. 4,449,511, Cl. 126-110.00R.
Head, Randall T. Non-skid device for wheelchairs and the like. 4,449,561, Cl. 152-213.00R.
Heal, Sam F.: *See*—
Sawka, Steven; Moretti, Vincent; and Heal, Sam F., 4,450,382, Cl. 315-082.000.
Heath, Boyd A.: *See*—
Herchenroeder, Robert B.; and Heath, Boyd A., 4,450,007, Cl. 75-10.00C.
Heaton, William C., to Howell, Rondal P., a part interest. Free piston internal combustion engine. 4,449,488, Cl. 123-46.00R.
Hebert, Alfred. Energy efficient damper for a furnace. 4,449,512, Cl. 126-292.000.
Hechenbleikner, Ingenuin; Enlow, William P.; and Lankin, David C., to Borg-Warner Chemicals, Inc. Zerovalent nickel phosphite complexes. 4,450,113, Cl. 260-439.00R.
Hefner, Robert E., Jr., to Dow Chemical Company, The. Imidazoline conditioner for the flotation of oxidized coal. 4,450,070, Cl. 209-3.000.
Hegarty, William P.; and Schmidt, William P., to Air Products and Chemicals, Inc. Low energy process for separating carbon dioxide and acid gases from a carbonaceous off-gas. 4,449,994, Cl. 62-17.000.
Hegedus, Allan J., to Mobil Oil Corporation. Efflux viscosity cup. 4,449,394, Cl. 73-55.000.
Heidelberger Druckmaschinen: *See*—
Junghans, Rudi, 4,449,451, Cl. 101-350.000.
Staffer, Julius; Walther, Karl-Heinz; and Jahn, Hans-Georg, 4,449,453, Cl. 101-416.00A.
Heine, Heinrich: *See*—
Messer, Dieter; Wilhelm, Volker; Endres, Robert; and Heine, Heinrich, 4,450,012, Cl. 106-300.000.
Held, Daniel N.: *See*—
Zebker, Howard A.; Held, Daniel N.; Goldstein, Richard M.; and Bickler, Thomas C., 4,450,447, Cl. 343-17.700.
Held, Kurt. Machine for guiding numerically controlled supports for tools used in woodworking operation. 4,449,986, Cl. 29-26.00A.
Helfman, Robert: *See*—
Shacket, Sheldon; and Helfman, Robert, 4,449,334, Cl. 52-79.300.
Heling, Dennis H.: *See*—
Murphy, Randall T.; and Heling, Dennis H., 4,449,751, Cl. 297-284.000.
Helix Technology Corporation: *See*—
Peterson, John F.; and Bartlett, Allen J., 4,449,373, Cl. 62-55.500.
Helm, Percy R.; and Morrow, James G., Sr., to Manitowoc Company, Inc., The. Imaginary pivot lift crane. 4,449,635, Cl. 212-196.000.
Helmes Machinefabriek B.V.: *See*—
Luyten, Jacobus H., 4,449,555, Cl. 144-198.00R.
Hemphill, Charles W., to GH Hensley Industries, Inc. Flat bottom bucket and digging teeth. 4,449,309, Cl. 37-141.00R.
Henderson, Matthew P., to Pennwalt Corporation. Blister pack loading machine. 4,449,351, Cl. 53-569.000.
Hengesbach, Robert W. Valve with handle-mounting ring. 4,449,696, Cl. 251-231.000.
Henley, Virgil E., to General Tire & Rubber Company, The. Method and apparatus for wrapping a tire bead ring. 4,450,025, Cl. 156-132.000.

Hennessy, James J.: *See*—
Salvucci, Orfeo J.; Hobby, John M.; Hennessy, James J.; and Young, Ronald R., 4,450,039, Cl. 156-504.000.
Henningsen, Dennis N. Insulation suspension system. 4,449,343, Cl. 52-404.000.
Henry, Ivor C., to Thorn Emi plc. Lanterns for area lighting. 4,450,509, Cl. 362-216.000.
Her Majesty the Queen in Right of Canada as represented by the Minister of National Defense: *See*—
Lightstone, Alexander W.; Eastwood, H. Keith; and Szarka, Frank, 4,449,781, Cl. 350-96.150.
Herchenroeder, Robert B.; and Heath, Boyd A., to Cabot Corporation. Process for electroslag remelting of manganese-base alloys. 4,450,007, Cl. 75-10.00C.
Hercules Incorporated: *See*—
Bloothoofd, William, 4,450,226, Cl. 430-300.000.
Simmons, Ronald L.; and Young, Herbert L., 4,450,110, Cl. 260-349.000.
Willis, Chester R., 4,450,302, Cl. 502-150.000.
Herlofson, Nicolai: *See*—
Alfven, Hannes; Herlofson, Nicolai; Babic, Miroslav; and Brunberg, Ernst-Ake, 4,449,577, Cl. 165-104.120.
Hermann, Jean; and Bourgeois, Claude, to Centre Electronique Horloger S.A. ZT-Cut piezo-electric resonator. 4,450,378, Cl. 310-361.000.
Hermans, Robert J.: *See*—
Ebbing, Steven J.; and Hermans, Robert J., 4,449,442, Cl. 91-44.000.
Herold, Robert; and Dubrous, Francis, to Societe Francaise d'Electrometallurgie Sofrem. Process and apparatus for the recovery of combustible gases in an electrometallurgy furnace. 4,450,003, Cl. 75-10.00R.
Herriau, Jean-Pierre: *See*—
Huignard, Jean-Pierre; and Herriau, Jean-Pierre, 4,449,785, Cl. 350-3.610.
Herrick, R. Clyde: *See*—
Goldy, Robert I.; and Herrick, R. Clyde, 4,449,716, Cl. 272-109.000.
Herrmann, Walter: *See*—
Steinsberger, Karl; Maier, Albert; and Herrmann, Walter, 4,449,868, Cl. 408-138.000.
Hertel, Otto; Linhart, Friedrich; and Scharf, Emil, to BASF Aktiengesellschaft. Preparation of water-soluble, nitrogen-containing condensates and their use in papermaking. 4,450,045, Cl. 162-164.300.
Hertel, Richard J.; and MacIntosh, Edward D., to Varian Associates, Inc. Wafer transfer system. 4,449,885, Cl. 414-750.000.
Herz, Claus P.: *See*—
Gehlhaus, Jurgen; and Herz, Claus P., 4,450,276, Cl. 548-303.000.
Hess, Richard L.: *See*—
Fuehrer, Reece R.; and Hess, Richard L., 4,449,422, Cl. 74-606.00R.
Hesse, Joseph F.: *See*—
Person, Herman R.; Hesse, Joseph F.; and Hall, Steven R., 4,450,441, Cl. 340-773.000.
Hettinger, Lon J. Quick evacuation fireman's coat. 4,449,253, Cl. 2-93.000.
Hettinger, William P., Jr.; Kovach, Stephen M.; and Hoffman, James F., to Ashland Oil, Inc. Endothermic removal of coke deposited on catalytic materials during carbo-metallic oil conversion. 4,450,241, Cl. 502-34.000.
Hettwer, Paul F.: *See*—
Sadler, Fred S.; Hettwer, Paul F.; Viet, Vu H.; and Acker, Clarence R., 4,450,424, Cl. 336-94.000.
Hewlett-Packard Company: *See*—
Reed, Ronald G.; Schmuckal, Robin R.; and McCullough, Robert K., 4,450,387, Cl. 315-375.000.
Hewlett-Packard GmbH: *See*—
Pross, Gerhard; and Rochlitzer, Frank, 4,449,537, Cl. 128-723.000.
Hi-Tec, Inc.: *See*—
Raether, Roger, 4,449,739, Cl. 285-14.000.
Hibi, Kunio: *See*—
Kikuchi, Hideo; Ikeda, Sunao; Kakitani, Yohtaro; Hibi, Kunio; and Okuzawa, Tugio, 4,449,813, Cl. 355-14.00R.
Hickernell, Fred S.: *See*—
Cho, Frederick Y.; and Hickernell, Fred S., 4,450,374, Cl. 310-313.00B.
Hicks, Raymond J., to Hicks Transmissions Limited. Multiple drum winches. 4,449,697, Cl. 254-297.000.
Hicks Transmissions Limited: *See*—
Hicks, Raymond J., 4,449,697, Cl. 254-297.000.
Hidaka, Yoshiaki: *See*—
Tsuchiyama, Tadashi; and Hidaka, Yoshiaki, 4,449,491, Cl. 123-90.340.
Higa, Walter H., to United States of America, National Aeronautics and Space Administration. Centrifugal-reciprocating compresaor. 4,449,894, Cl. 417-328.000.
Hild, Herbert A.; and Scanlon, Walter, to Hild Sails, Inc. Variable weight cloth roller-furling sail. 4,449,467, Cl. 114-103.000.
Hild Sails, Inc.: *See*—
Hild, Herbert A.; and Scanlon, Walter, 4,449,467, Cl. 114-103.000.
Hilfman, Lee: *See*—
Urban, Peter; Johnson, Russell W.; and Hilfman, Lee, 4,449,586, Cl. 166-303.000.
Hill, Jerry M.; and Lipe, Joel T., to FMC Corporation. Method and apparatus for determining encoder accuracy margin in a wheel balancer. 4,450,529, Cl. 364-508.000.
Hill, Ronald A., to United States of America, Energy. Variable aperture collimator for high energy radiation. 4,450,578, Cl. 378-152.000.
Hillestad, Tollief O. Portable tube milling tool. 4,449,871, Cl. 409-178.000.
Hilston, Michael D.: *See*—
Drake, Nancy J.; Hilston, Michael D.; and O'Malley, Mary A., 4,450,262, Cl. 526-234.000.
Hilti Aktiengesellschaft: *See*—
Kessler, Juergen, 4,449,877, Cl. 411-57.000.
Hinds, Charles M., to Spar Aerospace Limited. Satellite servicing. 4,449,684, Cl. 244-160.000.
Hinkle, John E.: *See*—
Demuth, Gordon L.; Hinkle, John E.; and Moran, J. Thomas, 4,450,525, Cl. 364-200.000.
Hinton, Deborah L. Endotracheal tube holder. 4,449,527, Cl. 128-207.170.
Hiramatsu, Akira: *See*—
Yamada, Masanori; and Hiramatsu, Akira, 4,449,803, Cl. 354-416.000.
Hirata, Isao, to Tokai Metals Company, Limited. Convenience container with cornered bottom. 4,450,581, Cl. 383-42.000.
Hirata, Kohzo: *See*—
Sato, Hideo; Goto, Yasuyuki; Saito, Hideo; Sawada, Shinichi; Matsunami, Keiichi; and Hirata, Kohzo, 4,450,094, Cl. 252-299.610.
Hirata, Makizo; and Ueda, Yoshiteru, to Kawasaki Jukogyo Kabushiki Kaisha. Exhaust device for 2-cycle engine. 4,449,608, Cl. 181-228.000.
Hirayama, Kazuhiro: *See*—
Kitamura, Takashi; Watanabe, Asao; Nakano, Takashi; Masaki, Katsumi; Hirayama, Kazuhiro; Sato, Yasushi; and Tokiwa, Taisuke, 4,450,453, Cl. 346-108.000.
Hirayama, Takashi; and Igarashi, Yuichi, to Iwasaki Tsushinki Kabushiki Kaisha. Two-way signal transmission and one-way DC power supply using a single line pair. 4,450,571, Cl. 375-7.000.
Hirose, Fumio: *See*—
Yoshikumi, Chikao; Ohmura, Yoshio; Hirose, Fumio; Ikuzawa, Masanori; Matsunaga, Kenichi; Fujii, Takayoshi; Ohhara, Minoru; and Ando, Takao, 4,450,156, Cl. 424-180.000.
Hirozawa, Stanley T.: *See*—
Wilson, Joe C.; and Hirozawa, Stanley T., 4,450,088, Cl. 252-75.000.
Hirsch, Guenter; and Ley, Gregor, to BASF Aktiengesellschaft. Grinding or dispersing agents for pigments. 4,450,013, Cl. 106-308.00N.
Hishinuma, Osamu: *See*—
Furuhashi, Yasuhiro; Miyata, Yukinori; and Hishinuma, Osamu, 4,449,504, Cl. 123-447.000.
Hitachi Heating Appliances Co., Ltd.: *See*—
Hotta, Kouichi; Yazawa, Yukichi; and Tatsukawa, Osami, 4,450,345, Cl. 219-491.000.
Hitachi Koki Company, Limited: *See*—
Iitsuka, Takeshi, 4,450,323, Cl. 200-1.00V.
Hitachi Ltd.: *See*—
Fujiwara, Hideo; Kudo, Mitsuhiro; Tamura, Teizo; Sugishita, Nobuyuki; Shiroishi, Yoshihiro; Kimura, Takeshi; Shinagawa, Kiminari; and Kumasaka, Noriyuki, 4,450,494, Cl. 360-125.000.
Furuhashi, Toshio, 4,449,502, Cl. 123-440.000.
Itoh, Fumikazu; Fujita, Yasuhiro; Kobayashi, Takashi; and Mifune, Takao, 4,449,293, Cl. 29-736.000.
Koizumi, Hideaki; Yamada, Hideo; and Oishi, Kounosuke, 4,449,820, Cl. 356-307.000.
Miyoshi, Tadahiko; Yamazaki, Takeo; Maeda, Kunihiro; Takahashi, Ken; and Oowada, Siniti, 4,450,426, Cl. 338-21.000.
Nagano, Takahiro; Sanpei, Isamu; Sakurada, Shuroku; and Nakagawa, Masaru, 4,450,467, Cl. 357-38.000.
Nakamura, Shigeru; Maeda, Takeshi; Kaku, Toshimitsu; Tsunoda, Yoshito; Takasugi, Wasao; and Kaneda, Tokuya, 4,450,547, Cl. 369-45.000.
Saito, Chuichi; Teranishi, Katsuya; Baba, Katsuyoshi; and Osumi, Yoshihiro, 4,449,623, Cl. 198-335.000.
Hitachi Metals, Ltd.: *See*—
Yamaguchi, Kazuo; Kusi, Asahiro; Akiyama, Nobuyuki; and Endo, Juro, 4,449,818, Cl. 356-237.000.
Hitchcock, Robert F.: *See*—
Anderson, David L.; Hitchcock, Robert F.; and Tamburrino, Robert M., 4,450,081, Cl. 210-445.000.
Ho, Eugene Y., to Techne Electronics, Ltd. Motion alarm system. 4,450,437, Cl. 340-540.000.
Hobart, Ralph J.; Rupp, Robert D.; and Mastro, Paul F., to Nibco, Inc. Blocked ball valve. 4,449,694, Cl. 251-171.000.
Hobbs, Charles C., Jr.: *See*—
McMillan, William P.; Hobbs, Charles C., Jr.; Gerberich, H. Robert; and Junker, Michael L., 4,450,301, Cl. 568-473.000.
Hobby, John M.: *See*—
Salvucci, Orfeo J.; Hobby, John M.; Hennessy, James J.; and Young, Ronald R., 4,450,039, Cl. 156-504.000.
Hochstein, Peter A. Condition monitoring system (tire pressure). 4,450,431, Cl. 340-58.000.
Hoechst Aktiengesellschaft: *See*—
Diery, Helmut; Deubel, Reinhold; and Weide, Joachim, 4,450,304, Cl. 568-609.000.
Elsner, Georg; and Hack, Hermann, 4,450,147, Cl. 423-304.000.
Morawietz, Hans-Joachim; Hoffman, Erich; Hanauer, Johann; and Bauer, Kurt, 4,450,116, Cl. 260-502.50E.
Hoff, Marcian E., Jr.; Townsend, Marshall A.; and Dreyer, Stephen F., to Intel Corporation. Digital logic buffer for converting single polarity analog signals to dual polarity analog signals. 4,450,365, Cl. 307-262.000.

Hoffman, Erich: *See*—
Morawietz, Hans-Joachim; Hoffman, Erich; Hanauer, Johann; and Bauer, Kurt, 4,450,116, Cl. 260-502.50E.
Hoffman, James F.: *See*—
Hettinger, William P., Jr.; Kovach, Stephen M.; and Hoffman, James F., 4,450,241, Cl. 502-34.000.
Hoffman, William F.; Smith, Robert L.; and Willard, Alvin K., to Merck & Co., Inc. Antihypercholesterolemic compounds. 4,450,171, Cl. 424-279.000.
Hoffmann-La Roche Inc.: *See*—
Luthy, Christoph, 4,450,157, Cl. 424-200.000.
Holbert, Don R. Method and apparatus for drilling a curved bore. 4,449,595, Cl. 175-79.000.
Holbert, Kenneth W.; and Massey, Edwin M., to Elxsi. Backplane fabrication method. 4,450,029, Cl. 156-250.000.
Holcomb, Dysart E.: *See*—
Kidwell, Louis E., Jr.; and Holcomb, Dysart E., 4,450,069, Cl. 208-255.000.
Hollaar, Lee A.; and Haskin, Roger L., to University of Illinois Foundation. Method and system for matching encoded characters. 4,450,520, Cl. 364-200.000.
Holmes, Brian N.; Dalzell, Rex J.; and Aasen, Steven M., to Minnesota Mining and Manufacturing Company. Dispersed imaging systems with tetra (hydrocarbyl) borate salts. 4,450,227, Cl. 430-339.000.
Holmes, Robert W.: *See*—
Dey, Arabinda N.; and Holmes, Robert W., 4,450,213, Cl. 429-105.000.
Holster, Peter L.; and Wittkamper, Johannes M., to U.S. Philips Corporation. Multilayer information disc. 4,450,553, Cl. 369-275.000.
Holt, James F. Coupling of MHD generator to gas turbine. 4,450,361, Cl. 290-1.00R.
Holtman, Dennis C., to Johnson & Johnson Baby Products Company. Absorbent structure having gradient densities. 4,449,979, Cl. 604-379.000.
Homan, Clarke G.; Kendall, David P.; and MacCrone, Robert K., to United States of America, Army. Production of cadmium sulfide compositions having unusual magnetic and electrical properties. 4,450,086, Cl. 252-62.510.
Honda Giken Kogyo Kabushiki Kaisha: *See*—
Shiratsuchi, Kouji, 4,449,723, Cl. 280-5.00H.
Tsuchiyama, Tadashi; and Hidaka, Yoshiaki, 4,449,491, Cl. 123-90.340.
Honda, Takeo: *See*—
Kamioka, Toshiharu; Nakayama, Isao; Honda, Takeo; Kobayashi, Takashi; Obata, Tokio; Fujii, Katsutoshi; Kojima, Mikio; and Akiyoshi, Yuji, 4,450,162, Cl. 424-251.000.
Hones, Helmut; and Mohaupt, Hubert, to Robert Bosch GmbH. Method and apparatus for steering a vehicle with fixed-position wheels. 4,449,598, Cl. 180-6.500.
Honeywell Inc.: *See*—
Castleman, B. Wayne; Donehoo, Robert F.; Oswald, Rudolph G.; Reed, Kenneth L.; and Shipley, George H., 4,450,409, Cl. 324-460.000.
Jewitt, Harold S., 4,450,449, Cl. 343-700.0MS.
Reynolds, George O., 4,450,358, Cl. 250-492.100.
Severson, Asbjorn M., 4,450,504, Cl. 361-369.000.
Spurr, Robert N., 4,450,411, Cl. 330-2.000.
Hoover Company, The: *See*—
Specht, Glenn E., 4,449,737, Cl. 285-7.000.
Hopkins, Thomas R., to Phillips Petroleum Company. Alcohol removal from blood with alcohol oxidase. 4,450,153, Cl. 424-94.000.
Hoppe, Joachim: *See*—
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Horbelt, Michael: *See*—
Glockler, Otto; Gunther, Dieter; Horbelt, Michael; and Steinbrenner, Ulrich, 4,449,508, Cl. 123-492.000.
Hori, Syunichi; and Kurihashi, Isao. Glass pane holder for window regulator. 4,449,326, Cl. 49-375.000.
Horie, Seiji; Nakano, Junji; and Sato, Hideo, to Fuji Photo Film Co., Ltd. Electrophotographic photoreceptor with thiobarbituric acid derivative. 4,450,219, Cl. 430-59.000.
Horii, Kenju: *See*—
Terakawa, Sumio; and Horii, Kenju, 4,450,484, Cl. 358-213.000.
Horiuchi, Tomofusa, to Nissan Motor Company, Limited. Idle-adjusting device for an internal combustion engine. 4,449,498, Cl. 123-339.000.
Horlebein, Eberhard: *See*—
Eiermann, Kurt; Horlebein, Eberhard; Lissmann, Kurt; and Schafer, Wolfgang, 4,449,402, Cl. 73-204.000.
Horn, Spencer C.; and Mogg, Alan A., to S & A Oil Field Services, Inc. Method of removing water from earthen pits. 4,449,849, Cl. 405-52.000.
Horne, David R., to U.S. Philips Corporation. Thermal imaging apparatus. 4,450,479, Cl. 358-113.000.
Horney, James R.: *See*—
Sauerwein, William D.; Sides, Daniel H.; Weber, Steven A.; and Horney, James R., 4,449,329, Cl. 51-168.000.
Horodysky, Andrew G., to Mobil Oil Corporation. Metal hydrocarbyl phosphorodithioates and lubricants containing same. 4,450,096, Cl. 252-32.70E.
Hoshijima, Yosuke: *See*—
Nakao, Yasuyuki; Hoshijima, Yosuke; and Okohira, Kazuo, 4,450,005, Cl. 75-60.000.
Hoshino Gakki Company, Limited: *See*—
Hoshino, Yoshihiro, 4,449,440, Cl. 84-422.00R.
Hoshino, Yoshihiro, to Hoshino Gakki Company, Limited. Adjustable stand for high-hat cymbal. 4,449,440, Cl. 84-422.00R.
Hotger, Karl, to Gebr. Eickhoff, Maschinenfabrik und Eisengiesserei, m.b.H. Rotary fluid coupling. 4,449,738, Cl. 285-11.000.
Hotta, Kouichi; Yazawa, Yukichi; and Tatsukawa, Osami, to Hitachi Heating Appliances Co., Ltd. Foodstuffs heating apparatus with selective heating functions. 4,450,345, Cl. 219-491.000.
Hounsel, Mack A.; and Byrd, Carlisle O., Jr., to Manville Service Corporation. Insulation module hardware. 4,449,345, Cl. 52-506.000.
House, Bruce F., to Shelley Manufacturing Company Division of Allo Food Service Equipment Company. Self-leveling plate dispenser. 4,449,760, Cl. 312-42.000.
Howard, Bruce S., to Boeing Company, The. Alloy testing apparatus using eddy current conductivity probe. 4,450,405, Cl. 324-234.000.
Howell, Rondal P.: *See*—
Heaton, William C., 4,449,488, Cl. 123-46.00R.
Hoy, James S. Swimming pool sweep. 4,449,265, Cl. 15-1.700.
Hsia, Chung H.: *See*—
Wright, Bernard S.; Owen, Hartley; and Hsia, Chung H., 4,450,311, Cl. 585-413.000.
Huang, I-Der: *See*—
Oswald, Alexis A.; Jermansen, Torris G.; Westner, Andrew A.; and Huang, I-Der, 4,450,299, Cl. 568-454.000.
Huang, Shu-Jen W., to Nalco Chemical Company. Reducing turbidity in turbid waters. 4,450,092, Cl. 252-181.000.
Hudson, Robert G.: *See*—
Ison, Billy G.; and Hudson, Robert G., 4,449,480, Cl. 119-4.000.
Huffman, Ronald E., to KV33 Corporation. Dental model articulator. 4,449,930, Cl. 433-64.000.
Hughes Aircraft Company: *See*—
Barry, James D.; and Denney, Joseph M., 4,450,489, Cl. 358-348.000.
Yum, Lawrence H.; and Chen, Fu-Chuan, 4,450,418, Cl. 333-128.000.
Hughes, Larry M., to RCA Corporation. Disc record player having stylus cleaner. 4,450,548, Cl. 369-71.000.
Huignard, Jean-Pierre; and Herriau, Jean-Pierre, to Thomson-CSF. Multiple hologram bulk optical storage device. 4,449,785, Cl. 350-3.610.
Huitema, Thomas W., to J. I. Case Company. Transmission control system. 4,449,416, Cl. 74-336.00R.
Humbert, Daniel: *See*—
Clemence, Francois; Hunt, Peter F.; Le Martret, Odile; and Humbert, Daniel, 4,450,166, Cl. 424-258.000.
Le Martret, Odile; Humbert, Daniel; and Hunt, Peter F., 4,450,167, Cl. 424-258.000.
Humphrey, Joseph R.: *See*—
Draper, Robert; Lackey, Robert S.; Fagan, Thomas J., Jr.; Veyo, Stephen E.; and Humphrey, Joseph R., 4,449,376, Cl. 62-259.100.
Humphrey, Michael N. R. Golf practice device. 4,449,708, Cl. 273-186.00A.
Humphries, Darral V.: *See*—
Austen, Alfred R.; and Humphries, Darral V., 4,449,904, Cl. 425-97.000.
Hunt, Joseph M., to Allegheny Ludlum Steel Corporation. Composite article for a semiconductor device. 4,450,208, Cl. 428-620.000.
Hunt, Peter F.: *See*—
Clemence, Francois; Hunt, Peter F.; Le Martret, Odile; and Humbert, Daniel, 4,450,166, Cl. 424-258.000.
Le Martret, Odile; Humbert, Daniel; and Hunt, Peter F., 4,450,167, Cl. 424-258.000.
Hupfer, Leopold: *See*—
Graf, Fritz; and Hupfer, Leopold, 4,450,277, Cl. 548-346.000.
Hurst, Jerry C.: *See*—
Abraham, Bruce C.; Fegley, Charles R.; and Hurst, Jerry C., 4,449,282, Cl. 29-467.000.
Huschke, Bruno. Device for testing filters, particularly sterile filters. 4,449,392, Cl. 73-40.000.
Huss, Otto: *See*—
Marker, Hannes; and Huss, Otto, 4,449,466, Cl. 114-91.000.
Hutchins, Walter J.: *See*—
Drechsler, Mark A.; and Hutchins, Walter J., 4,449,302, Cl. 33-138.000.
Huther, Werner, to MTU Motoren-und Turbinen Union Munchen GmbH. Thermocouple for measuring temperatures and method of making the thermocouple. 4,450,314, Cl. 136-230.000.
Hydra-Jack, Inc.: *See*—
Cory, William W., 4,449,734, Cl. 280-766.100.
Hydro Rene Leduc: *See*—
Porel, Louis C., 4,449,552, Cl. 138-30.000.
Hylsa, S.A.: *See*—
Martinez-Vera, Enrique R.; and Guerra-Garcia, Gilberto, 4,449,671, Cl. 241-36.000.
Hynds, John R., to J. R. Hynds Limited. Methods and/or apparatus for increasing the overturning resistance of retaining walls. 4,449,858, Cl. 405-286.000.
Iacoviello, John G., to Air Products and Chemicals, Inc. Nonwoven products having low residual free formaldehyde content. 4,449,978, Cl. 604-372.000.
Ibrahim, Fayez F., to Tyler Refrigeration Corporation. Combination hot gas and air defrost refrigerated display case. 4,449,374, Cl. 62-81.000.
Ichinose, Toru: *See*—
Tezuka, Etsuhiro; Kaji, Koichiro; and Ichinose, Toru, 4,449,505, Cl. 123-447.000.

Idel, Karsten; Freitag, Dieter; and Merten, Josef, to Bayer Aktiengesellschaft. Use of siloxanes for the modification of high molecular weight p-polyphenylene sulphides. 4,450,266, Cl. 524-265.000.
IFM Akustikbyran AB- Warfvinges vag 26: *See*—
Hagbjer, Gunnar, 4,450,195, Cl. 428-178.000.
Igarashi, Yuichi: *See*—
Hirayama, Takashi; and Igarashi, Yuichi, 4,450,571, Cl. 375-7.000.
Iida, Akio; and Kurihara, Osamu, to Kabushiki Kaisha Komatsu Seisakusho. Elevationally adjustable fluid suspension system for a wheel tractor scraper or the like. 4,449,733, Cl. 280-707.000.
IIT Research Institute: *See*—
Bridges, Jack E.; and Taflove, Allen, 4,449,585, Cl. 166-248.000.
Iitsuka, Takeshi, to Hitachi Koki Company, Limited. Reversible switch. 4,450,323, Cl. 200-1.00V.
Ikeda, Masami: *See*—
Sugitani, Hiroshi; Ozawa, Masakazu; Matsuda, Hiroto; Ikeda, Masami; and Matsumoto, Haruyuki, 4,450,455, Cl. 346-140.0PQ.
Ikeda, Sunao: *See*—
Kikuchi, Hideo; Ikeda, Sunao; Kakitani, Yohtaro; Hibi, Kunio; and Okuzawa, Tugio, 4,449,813, Cl. 355-14.00R.
Ikedo, Yuji; Kenmotsu, Isami; and Isobe, Nobuyuki, to Pioneer Electronic Corporation. Compact bookshelf type record player. 4,450,549, Cl. 369-75.100.
Ikemoto, Yutaka; and Tanimoto, Akira, to Sharp Kabushiki Kaisha. Speech synthesizer timepiece. 4,449,829, Cl. 368-63.000.
Ikesue, Masumi; and Yanagawa, Nobuyuki, to Ricoh Company, Ltd. Electrophotographic copying machine with means for mixing and removing toner and an integral exposure plate. 4,449,810, Cl. 355-3.0DD.
Ikuta, Yasuhiro: *See*—
Moriguchi, Koichi; Iwamoto, Kenzi; Matushiro, Ryuichi; Kawai, Hisasi; Mizuno, Nobutaka; and Ikuta, Yasuhiro, 4,449,367, Cl. 60-602.000.
Sone, Shigeru; Ikuta, Yasuhiro; Komiya, Kazuaki; Kihira, Kazuhide; and Mizuno, Nobutaka, 4,449,371, Cl. 60-611.000.
Ikuzawa, Masanori: *See*—
Yoshikumi, Chikao; Ohmura, Yoshio; Hirose, Fumio; Ikuzawa, Masanori; Matsunaga, Kenichi; Fujii, Takayoshi; Ohhara, Minoru; and Ando, Takao, 4,450,156, Cl. 424-180.000.
Illinois Tool Works Inc.: *See*—
Barth, Gerald D., 4,449,873, Cl. 411-341.000.
IMED Corporation: *See*—
Farr, Andrew F., 4,450,079, Cl. 604-152.000.
Imperial Chemical Industries PLC: *See*—
Lake, Ivan J. S.; and Whittam, Thomas V., 4,450,312, Cl. 585-481.000.
Implant Technologies, Inc.: *See*—
Szachowicz, Edward H.; and Walsh, John, 4,449,523, Cl. 128-200.260.
Inagaki, Takefumi: *See*—
Nakashima, Masato; Koezuka, Tetsuo; and Inagaki, Takefumi, 4,450,579, Cl. 382-8.000.
Inatani, Reiko: *See*—
Nakatani, Nobuji; Inatani, Reiko; and Konishi, Tadashi, 4,450,097, Cl. 252-404.000.
Industri AB Thule: *See*—
Wouden, Adriaan v. d., 4,449,656, Cl. 224-320.000.
Industrial Technology Research Institute: *See*—
Su, Tsung-Tsan; and Cheng, Yu-Chen, 4,450,271, Cl. 544-354.000.
Ingemann, Ole: *See*—
Jorgensen, Knud E.; and Ingemann, Ole, 4,449,641, Cl. 220-306.000.
Inoue, Eiichi: *See*—
Shimizu, Isamu; Ogawa, Kyosuke; and Inoue, Eiichi, 4,450,185, Cl. 427-39.000.
Inoue-Japax Research Incorporated: *See*—
Inoue, Kiyoshi, 4,450,336, Cl. 219-69.00M.
Inoue, Kiyoshi, 4,450,337, Cl. 219-69.00M.
Inoue, Kazuyuki: *See*—
Shimizu, Toshiki; and Inoue, Kazuyuki, 4,450,335, Cl. 219-10.55C.
Inoue, Kiyoshi, to Inoue-Japax Research Incorporated. Super-fine finish EDM method and apparatus. 4,450,336, Cl. 219-69.00M.
Inoue, Kiyoshi, to Inoue-Japax Research Incorporated. EDM Method and apparatus with a continuous DC supply using stray gap capacitance to trigger discharge. 4,450,337, Cl. 219-69.00M.
Institut Francais du Petrole: *See*—
Cessou, Maurice; and Perez, Lucien, 4,449,850, Cl. 405-60.000.
Intel Corporation: *See*—
Hoff, Marcian E., Jr.; Townsend, Marshall A.; and Dreyer, Stephen F., 4,450,365, Cl. 307-262.000.
International Business Machines Corporation: *See*—
Boed, George L.; and Satya, Akella V. S., 4,450,559, Cl. 371-10.000.
Demuth, Gordon L.; Hinkle, John E.; and Moran, J. Thomas, 4,450,525, Cl. 364-200.000.
Goff, Willie, Jr.; Rakes, James M.; and Williams, Errol R., 4,450,342, Cl. 219-216.000.
Gotze, Volkmar; and Potz, Gunther, 4,450,561, Cl. 371-37.000.
Korth, Hans-Erdmann, 4,449,782, Cl. 350-96.160.
Reisman, Arnold; Berkenblit, Melvin; and Merz, Charles J., III, 4,449,580, Cl. 165-104.340.
Watrous, Robert B., 4,450,493, Cl. 360-106.000.
International Flavors & Fragrances Inc.: *See*—
Sprecker, Mark A.; and Hall, John B., 4,450,101, Cl. 252-522.00R.
Yoshida, Takao, 4,450,296, Cl. 568-316.000.
International Standard Electric Corporation: *See*—
Apitz, Siegfried; and Nonnenmann, Rolf, 4,450,349, Cl. 235-462.000.
Briese, Wolfgang, 4,450,377, Cl. 310-348.000.
Nill, Eberhard, 4,449,951, Cl. 445-34.000.
International Telephone and Telegraph Corporation: *See*—
Burbo, James H.; Hartman, Louis P.; Spranger, Douglas M.; Brookes, Malcolm J.; and Mulhauser, Paul J., 4,449,787, Cl. 350-538.000.
Steensma, Peter D.; Weinberg, Murray; Smid, Robert W.; and Finley, Thomas E., 4,450,554, Cl. 370-4.000.
Invacare Respiratory Corp.: *See*—
Tedford, Richard A., Jr., 4,449,990, Cl. 55-26.000.
Involvo AG: *See*—
Roth, Oskar, 4,449,349, Cl. 53-66.000.
Ipco Corporation: *See*—
Weissman, Bernard, 4,449,937, Cl. 433-225.000.
Irwin, George W.; and Mumford, Eustace H., to Owens-Illinois, Inc. Parallel motion blank mold operating mechanism. 4,449,996, Cl. 65-305.000.
Ishido, Yoshinobu; and Tanaka, Hideo, to Hayakawa Rubber Company Limited. Aqueously-swelling water stopper and a process of stopping water thereby. 4,449,713, Cl. 277-1.000.
Ishiguro, Tsuneo: *See*—
Ito, Nobuo; Takeuchi, Koji; Abe, Masahiro; and Ishiguro, Tsuneo, 4,450,267, Cl. 528-99.000.
Ishihara, Shoichi: *See*—
Kitao, Teijiro; Setsune, Jun-ichiro; Ishihara, Shoichi; and Yamamoto, Ryoichi, 4,449,516, Cl. 126-430.000.
Ishii, Masami; Sugimoto, Hitoshi; Takeda, Shinji; and Shibata, Susumu, to Aisin Seiki Kabushiki Kaisha. Hot air blast welding apparatus for thermoplastic parts. 4,450,038, Cl. 156-497.000.
Ishikawa, Kiyotsugu; Sone, Yoshiaki; Hashimoto, Susumu; Omae, Masanori; and Kunii, Takao, to Matsushita Electric Industrial Co., Ltd. Solid state color imaging apparatus. 4,450,475, Cl. 358-44.000.
Ishitobi, Chikato: *See*—
Arimoto, Satomi; Yamaji, Shigeru; and Ishitobi, Chikato, 4,450,329, Cl. 200-148.00A.
Ishiyama, Shozo: *See*—
Arai, Norikazu; Ishiyama, Shozo; and Kojima, Tadashi, 4,449,792, Cl. 350-432.000.
Isley, Ralph E.; Prem, Dorothy C.; and Duke, June T., to Standard Oil Company. Impact improvement of high nitrile resins. 4,450,254, Cl. 524-399.000.
Isobe, Nobuyuki: *See*—
Ikedo, Yuji; Kenmotsu, Isami; and Isobe, Nobuyuki, 4,450,549, Cl. 369-75.100.
Ison, Billy G.; and Hudson, Robert G., to Tennessee Valley Authority. Culture of freshwater mussel glochidia in an artificial habitat utilizing complex liquid growth media. 4,449,480, Cl. 119-4.000.
Istvan, Csakany: *See*—
Bela, Batyi; Geza, Gulyas; Zoltan, Bozso; Istvan, Csakany; and Janos, Bartucz, 4,449,460, Cl. 110-214.000.
Itaba, Takeshi; Matsumoto, Shotaro; and Abe, Takeshi, to Mitsubishi Kinzoku Kabushiki Kaisha. Surface-coated blade member of super hard alloy for cutting tools and process for producing same. 4,450,205, Cl. 428-552.000.
Itami, Masaru; and Tatusawa, Kunio, to Rhythm Watch Co., Ltd. Pendulum arrangement for clock movement. 4,449,831, Cl. 368-165.000.
Ito, Keisuke; Kashihara, Toshiaki; and Okino, Yoshihiro, to Matsushita Electric Industrial Co., Ltd. Device for manufacturing information recording mediums. 4,449,916, Cl. 425-174.400.
Ito, Kenji: *See*—
Shimba, Satoru; Ito, Kenji; Tsuda, Yasuo; and Sugita, Hiroshi, 4,450,228, Cl. 430-505.000.
Ito, Masao: *See*—
Takagi, Satoshi; Watanabe, Toshio; and Ito, Masao, 4,450,491, Cl. 360-96.500.
Ito, Nobuo; Takeuchi, Koji; Abe, Masahiro; and Ishiguro, Tsuneo, to Ajinomoto Company Incorporated. Latent curing agents for epoxy resins. 4,450,267, Cl. 528-99.000.
Ito, Shoji, to Aisan Kogyo Kabushiki Kaisha. Fuel injection system. 4,449,499, Cl. 123-339.000.
Ito, Takaaki: *See*—
Nakamura, Norihiko; Ito, Takaaki; Katou, Takashi; Ota, Yozo; and Morino, Toshiharu, 4,450,117, Cl. 261-39.00A.
Ito, Takashi: *See*—
Hayashi, Keijiro; Awano, Toshimi; Yoshikawa, Masayuki; Yazawa, Kouzou; and Ito, Takashi, 4,449,707, Cl. 273-171.000.
Ito, Yukio: *See*—
Meguro, Takeshi; and Ito, Yukio, 4,450,421, Cl. 333-202.000.
Itoh, Fumikazu; Fujita, Yasuhiro; Kobayashi, Takashi; and Mifune, Takao, to Hitachi, Ltd. Coil winding and inserting machine. 4,449,293, Cl. 29-736.000.
Itoh, Kazuo: *See*—
Kudo, Toshiyuki; Itoh, Kazuo; and Kitamura, Masafumi, 4,450,551, Cl. 369-173.000.
Itoh, Takashi: *See*—
Haneda, Satoshi; Itoh, Takashi; Nakamura, Ken; and Tomono, Makoto, 4,450,220, Cl. 430-102.000.
ITT Industries, Inc.: *See*—
Alexander, John H., 4,450,502, Cl. 361-309.000.
Andrei-Alexandru, Marcel; and Prohaska, Hans, 4,450,390, Cl. 318-282.000.

Drake, Cyril F.; and Brocklehurst, John R., 4,449,981, Cl. 604-890.000.
Klee, Heinz, 4,450,518, Cl. 364-183.000.
Schmidtpott, Friedrich; and Backes, Reiner, 4,450,432, Cl. 340-146.200.

Iwamoto, Kenzi: *See*—
Moriguchi, Koichi; Iwamoto, Kenzi; Matushiro, Ryuichi; Kawai, Hisasi; Mizuno, Nobutaka; and Ikuta, Yasuhiro, 4,449,367, Cl. 60-602.000.

Iwamura, Junichi; and Komai, Koichiro, to Iwamura, Junichi; Gakko Hojin Kinki Daigaku (Educational Foundation Kinki Univ.); and Komai, Koichiro. Plant growth regulator. 4,449,997, Cl. 71-88.000.

Iwasaki Tsushinki Kabushiki Kaisha: *See*—
Hirayama, Takashi; and Igarashi, Yuichi, 4,450,571, Cl. 375-7.000.

Iwato, Susumu; Nakamura, Tatuo; and Kurauchi, Takeo, to Nippon Paint Co., Ltd. Coating composition and coated article. 4,450,200, Cl. 428-323.000.

Izawa, Motowo: *See*—
Hasegawa, Toru; Izawa, Motowo; and Tanida, Seiichi, 4,450,234, Cl. 435-253.000.

J. I. Case Company: *See*—
Huitema, Thomas W., 4,449,416, Cl. 74-336.00R.

J. R. Hynds Limited: *See*—
Hynds, John R., 4,449,858, Cl. 405-286.000.

Jablin, Morton: *See*—
Kohl, Karl, 4,449,381, Cl. 66-203.000.
Kohl, Karl, 4,449,382, Cl. 66-203.000.

Jachimowicz, Felek, to W. R. Grace & Co. Novel polyurethane catalysts in polyurethane foam process. 4,450,246, Cl. 521-129.000.

Jacobs, James R. Composite static structure. 4,449,348, Cl. 52-648.000.

Jacobsen, Christian C.: *See*—
Hampton, Dean A.; Jacobsen, Christian C.; and Profet, Gary A., 4,450,558, Cl. 370-106.000.

Jageler, Alfred H.; Bruce, Gary D.; and Mount, Houston B., II, to Standard Oil Company. Guide for sidewall coring bit assembly. 4,449,593, Cl. 175-58.000.

Jagenberg AG: *See*—
Zodrow, Rodolf; and Buchholz, Rainer, 4,450,040, Cl. 156-567.000.

Jahn, Hans-Georg: *See*—
Staffer, Julius; Walther, Karl-Heinz; and Jahn, Hans-Georg, 4,449,453, Cl. 101-416.00A.

Jahsman, Hendrick; and Menor, George, to Siemens Medical Laboratories, Inc. Medical couch incorporating a lifting mechanism. 4,449,262, Cl. 5-63.000.

James, Bobby D., to James, Bobby Dencil. Analog debris alarm. 4,450,435, Cl. 340-511.000.

James, Bobby Dencil: *See*—
James, Bobby D., 4,450,435, Cl. 340-511.000.

Janes, Timothy W.; and White, John C., to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the. Method for producing a vertical channel transistor. 4,449,285, Cl. 29-571.000.

Janos, Bartucz: *See*—
Bela, Batyi; Geza, Gulyas; Zoltan, Bozso; Istvan, Csakany; and Janos, Bartucz, 4,449,460, Cl. 110-214.000.

Janssen, Johannes A.: *See*—
Weterings, Cornelis A.M.; and Janssen, Johannes A., 4,450,142, Cl. 423-8.000.

Janssen, Lutz J.; and Le Quement, Patrick, to Ford Motor Company. Streamlined adjustable exterior rearview mirror. 4,449,796, Cl. 350-582.000.

Jekel, Gerd; and Obenaus, Franz, to U.S. Philips Corporation. Cassette comprising a capping device and a cleaning device for an ink jet printer. 4,450,456, Cl. 346-140.00R.

Jentoft, Arthur P.; and Couture, Paul A., to Wasco Products, Inc. Ventilating skylight. 4,449,340, Cl. 52-200.000.

Jeol Ltd.: *See*—
Tsuno, Katsushige, 4,450,357, Cl. 250-356.0ML.

Jereb, Richard F.: *See*—
Wolf, Ronald J.; Jereb, Richard F.; and Farmer, Mark, 4,449,497, Cl. 123-335.000.

Jermansen, Torris G.: *See*—
Oswald, Alexis A.; Jermansen, Torris G.; Westner, Andrew A.; and Huang, I-Der, 4,450,299, Cl. 568-454.000.

Jeumont Schneider Corporation: *See*—
Salmon, Jean P.; and Theze, Claude P., 4,449,685, Cl. 246-8.000.

Jewitt, Harold S., to Honeywell Inc. Patch array antenna. 4,450,449, Cl. 343-700.0MS.

Johansen, David K.: *See*—
Lambert, Frederick J.; Bosack, Donald J.; and Johansen, David K., 4,450,401, Cl. 320-22.000.

John Crane Houdaille, Inc.: *See*—
Radosay, Jon J.; and Wilson, John R., 4,449,719, Cl. 277-192.000.

Johnsen & Jorgensen (Plastics) Ltd.: *See*—
Davis, Eugene E., 4,449,638, Cl. 215-211.000.
Davis, Eugene E., 4,449,639, Cl. 215-224.000.

Johnson, Harold D.; Sherman, Earle C.; and Cooper, Leonard M., to Manville Service Corporation. Ovenable paperboard carton. 4,449,633, Cl. 206-612.000.

Johnson, James R. Hole punching apparatus for thermoplastic film. 4,449,434, Cl. 83-98.000.

Johnson & Johnson: *See*—
Korpman, Ralf, 4,449,977, Cl. 604-366.000.

Johnson & Johnson Baby Products Company: *See*—
Holtman, Dennis C., 4,449,979, Cl. 604-379.000.
Pieniak, Heinz A.; and Repke, Virginia L., 4,450,026, Cl. 156-164.000.

Johnson, Russell W.: *See*—
Urban, Peter; Johnson, Russell W.; and Hilfman, Lee, 4,449,586, Cl. 166-303.000.

Johnson, Thomas B., III, to Cooper Industries, Inc. Electrical connector for top and side mount battery terminals. 4,449,772, Cl. 339-29.00B.

Johnston, Thomas J.; Richards, Nolan E.; and Tabereaux, Alton T., to Reynolds Metals Company. Probe for alumina concentration meter. 4,450,063, Cl. 204-400.000.

Jones, William H., to Eaton Corporation. Washing appliance control circuitry. 4,449,384, Cl. 68-12.00R.

Jordan, Robert E., to Cutter Laboratories, Inc. Water insoluble gel matrix containing lectin bound to antithrombin. 4,450,104, Cl. 260-112.00B.

Jorgensen, Knud E.; and Ingemann, Ole, to D.M.E. Plastic A/S. Container of plastic material with a lid. 4,449,641, Cl. 220-306.000.

Joshi, Madhusudan: *See*—
Cerwin, Robert J.; Joshi, Madhusudan; Menges, John R.; Mericle, Robert W.; and Zwaskis, William J., 4,449,531, Cl. 128-325.000.

Juhola, Mauno O. Means for providing a vertical drain in soil. 4,449,848, Cl. 405-50.000.

Jujo Paper Co., Ltd.: *See*—
Egawa, Setsuya; and Sakamoto, Masahiro, 4,450,123, Cl. 264-4.700.

Junghans, Rudi, to Heidelberger Druckmaschinen. Inking unit for printing presses. 4,449,451, Cl. 101-350.000.

Junker, Michael L.: *See*—
McMillan, William P.; Hobbs, Charles C., Jr.; Gerberich, H. Robert; and Junker, Michael L., 4,450,301, Cl. 568-473.000.

k. k. Yamada Kogaku Seisakusho: *See*—
Yamada, Toshikatsu, 4,449,795, Cl. 350-516.000.

Kabalka, George W., to Research Corporation. Radiohalogenation method. 4,450,149, Cl. 424-1.100.

Kabel- und Metallwerke: *See*—
Baum, Walter; Still, Michael; and Becker, Erich, 4,449,576, Cl. 165-104.330.

Kabushiki Kaisha Komatsu Seisakusho: *See*—
Iida, Akio; and Kurihara, Osamu, 4,449,733, Cl. 280-707.000.
Sato, Hideyori; and Arai, Mitsuru, 4,449,366, Cl. 60-444.000.

Kabushiki Kaisha Kubota Seisakusho: *See*—
Hara, Minoru, 4,450,391, Cl. 318-313.000.

Kabushiki Kaisha Meidensha: *See*—
Yanagisawa, Hifumi; Warabi, Junichi; and Kashiwagi, Yoshiyuki, 4,450,327, Cl. 200-144.00B.

Kabushiki Kaisha Sato: *See*—
Miyamoto, Takehiko, 4,449,433, Cl. 83-76.000.

Kabushiki Kaisha Suwa Seikosha: *See*—
Arai, Kenichiro, 4,449,835, Cl. 400-161.000.
Koto, Haruhiko, 4,450,454, Cl. 346-140.00R.

Kabushiki Kaisha Tanaka Seisakusho: *See*—
Ashizawa, Takeshi; and Yasumura, Motoaki, 4,449,699, Cl. 266-58.000.
Hayasaki, Hidehiko; and Yasumura, Motoaki, 4,450,014, Cl. 148-9.00R.

Kabushiki Kaisha Tokai Rika Denki Seisakusho: *See*—
Suzuki, Masaru, 4,449,788, Cl. 350-289.000.

Kaiser, Hermann; and Olson, Jerry A., to Eaton Corporation. Hot film/swirl fluid flowmeter. 4,449,401, Cl. 73-202.000.

Kaji, Koichiro: *See*—
Tezuka, Etsuhiro; Kaji, Koichiro; and Ichinose, Toru, 4,449,505, Cl. 123-447.000.

Kakitani, Yohtaro: *See*—
Kikuchi, Hideo; Ikeda, Sunao; Kakitani, Yohtaro; Hibi, Kunio; and Okuzawa, Tugio, 4,449,813, Cl. 355-14.00R.

Kaku, Toshimitsu: *See*—
Nakamura, Shigeru; Maeda, Takeshi; Kaku, Toshimitsu; Tsunoda, Yoshito; Takasugi, Wasao; and Kaneda, Tokuya, 4,450,547, Cl. 369-45.000.

Kalua, John. Apparatus for fining bottled wine. 4,449,886, Cl. 414-776.000.

Kamat, Dattatraya V., to Crown Textile Company. Composite fusible interlining fabric and method. 4,450,196, Cl. 428-197.000.

Kamata, Keiji: *See*—
Mithuhira, Kuniaki; Kamata, Keiji; and Suzuki, Hikoshiro, 4,449,664, Cl. 236-49.000.

Kamen, Dean L., to Baxter Travenol Laboratories, Inc. Device for preserving continuity of intravenous flow. 4,449,976, Cl. 604-254.000.

Kamhi, Victor M., to American Cyanamid Company. Poly(ethyleneoxy)-substituted-9,10-bis(phenylethynyl)anthracenes. 4,450,305, Cl. 568-611.000.

Kamijyo, Yoshimi: *See*—
Kano, Mitsuru; and Kamijyo, Yoshimi, 4,450,100, Cl. 252-518.000.

Kamioka, Toshiharu; Nakayama, Isao; Honda, Takeo; Kobayashi, Takashi; Obata, Tokio; Fujii, Katsutoshi; Kojima, Mikio; and Akiyoshi, Yuji, to Sankyo Company, Limited; and Ube Industries Limited. Pyrimidine derivatives and a pharmaceutical composition containing them. 4,450,162, Cl. 424-251.000.

Kammerer, Gerd, to Dieter Graesslin Feinwerktechnik. Program input and/or time setting device. 4,449,832, Cl. 368-187.000.

Kampfmann, Georg, to AMP Incorporated. Contact positioning apparatus. 4,449,883, Cl. 414-744.00A.

Kaneda, Tokuya: *See*—
Nakamura, Shigeru; Maeda, Takeshi; Kaku, Toshimitsu; Tsunoda, Yoshito; Takasugi, Wasao; and Kaneda, Tokuya, 4,450,547, Cl. 369-45.000.

Kanegafuchi Kagaku Kogyo Kabushiki Kaisha: *See*—
Hamakawa, Yoshihiro; and Tawada, Yoshihisa, 4,450,316, Cl. 136-256.000.
Matsumoto, Sigemi; and Nagoshi, Fumiya, 4,450,256, Cl. 525-316.000.

Kaneko, Thomas M.; Dutton, Daniel R.; and Kim, Bongsub, to BASF Wyandotte Corporation. Anionic biocide emulsions in aqueous solutions of strongly ionizable salts. 4,450,001, Cl. 71-118.000.

Kanii, Norikazu: *See*—
Hasegawa, Toshifumi; and Kanii, Norikazu, 4,449,277, Cl. 29-33.00P.

Kanny, Louis. Speech controlled start-stop of tape recorder in record and reproduce modes by separate microphone. 4,450,546, Cl. 369-24.000.

Kano, Mitsuru; and Kamijyo, Yoshimi, to Alps Electric Co., Ltd. Paste for forming transparent conductive coating film. 4,450,100, Cl. 252-518.000.

Kapaan, Hendrikus J., to SKF Industrial Trading & Development Company B.V. Automatically variable drive apparatus having at least one V-belt running over variable diameter pulleys. 4,449,957, Cl. 474-14.000.

Karaktin, Vincent M., to Emerson Electric Co. System and method of mounting a lamp holder on a support. 4,449,687, Cl. 248-225.200.

Karg, Rudy F.: *See*—
Von Bodungen, George A.; and Karg, Rudy F., 4,450,260, Cl. 526-213.000.

Karkiewicz, Kenneth G., to Ethyl Molded Products Company. Mixing device. 4,449,827, Cl. 366-131.000.

Karl Lautenschlager KG, Mobelbeschlagfabrik: *See*—
Lautenschlager, Karl; and Viniol, Gerd, 4,449,689, Cl. 248-544.000.

Karl Mayer Textilmaschinenfabrik GmbH: *See*—
Wilkens, Christian, 4,449,380, Cl. 66-84.00A.

Karlsson, Kurt: *See*—
Pettersson, Birger; and Karlsson, Kurt, 4,449,573, Cl. 165-10.000.

Karubian, Ralph. Carcass saw. 4,449,271, Cl. 17-23.000.

Kashihara, Toshiaki: *See*—
Ito, Keisuke; Kashihara, Toshiaki; and Okino, Yoshihiro, 4,449,916, Cl. 425-174.400.

Kashima, Shoichi: *See*—
Tokoro, Takehiko; Kashima, Shoichi; and Murata, Mineo, 4,449,856, Cl. 405-269.000.

Kashiwagi, Yoshiyuki: *See*—
Yanagisawa, Hifumi; Warabi, Junichi; and Kashiwagi, Yoshiyuki, 4,450,327, Cl. 200-144.00B.

Kaspersma, Jelle H.: *See*—
Berger, Kerry R.; Kaspersma, Jelle H.; Luybli, Joseph R.; Millward, Barry; and Shay, Robert H., 4,450,017, Cl. 148-16.000.

Kasugayama, Yukio: *See*—
Miyachi, Takeshi; Tsuda, Hisanori; Hara, Toshitami; and Kasugayama, Yukio, 4,450,457, Cl. 346-140.00R.

Katou, Takashi: *See*—
Nakamura, Norihiko; Ito, Takaaki; Katou, Takashi; Ota, Yozo; and Morino, Toshiharu, 4,450,117, Cl. 261-39.00A.

Katsuhara, Yutaka: *See*—
Kondow, Takeshi; Okazaki, Koshi; Katsuhara, Yutaka; and Matsuoka, Kimiaki, 4,450,298, Cl. 568-437.000.

Katsura, Masaki: *See*—
Takikawa, Osamu; Katsura, Masaki; Tanuma, Chiaki; and Yokoyama, Katsunori, 4,449,919, Cl. 431-76.000.

Kauffman, William J.; and Wright, Ralph W., to Armstrong World Industries, Inc. Decorative laminate. 4,450,194, Cl. 428-172.000.

Kaufman, Lance R. Method of clamping a circuit package to enhance heat transfer. 4,449,292, Cl. 29-631.000.

Kawai, Hisasi: *See*—
Moriguchi, Koichi; Iwamoto, Kenzi; Matushiro, Ryuichi; Kawai, Hisasi; Mizuno, Nobutaka; and Ikuta, Yasuhiro, 4,449,367, Cl. 60-602.000.

Kawakami, Tomio: *See*—
Ohta, Minoru; Hattori, Yutaka; Kawakami, Tomio; and Onoda, Michitosi, 4,450,428, Cl. 338-34.000.

Kawamura, Akira; and Ono, Tadahiro, to Toshiba Kikai Kabushiki Kaisha; and Toei Denki Kabushiki Kaisha. System for controlling synchronous motors. 4,450,395, Cl. 318-700.000.

Kawamura, Masaharu: *See*—
Sakurada, Nobuaki; Kawamura, Masaharu; Ohtaki, Shohei; Nakamoto, Soichi; and Shinoda, Nobuhiko, 4,449,805, Cl. 354-105.000.

Kawasaki Jukogyo Kabushiki Kaisha: *See*—
Hirata, Makizo; and Ueda, Yoshiteru, 4,449,608, Cl. 181-228.000.
Yoshida, Toshio; Matsui, Shigetomo; and Atsuta, Toshio, 4,449,281, Cl. 29-421.00R.

Kawasaki Kasei Chemicals Ltd.: *See*—
Komatsu, Tatsuyoshi; Numata, Shigeaki; and Maruyama, Kazuhiro, 4,450,111, Cl. 260-369.000.

Kawase, Shoji: *See*—
Yamada, Takeyoshi; Kurisu, Shizuka; Azuma, Shizuo; Kawase, Shoji; and Sano, Makoto, 4,449,992, Cl. 55-158.000.

Kawasumi, Shinroku. Process for the preparation of precious metal-coated particles. 4,450,188, Cl. 427-217.000.

Kawatei, Hisatsugu; Saito, Hidetoshi; and Nakamura, Hisashi, to Diesel Kiki Company, Ltd. Injection compensator for fuel injection pump. 4,449,500, Cl. 123-380.000.

Kayaba Kogyo Kabushiki Kaisha: *See*—
Hasegawa, Mitsuhiro, 4,449,702, Cl. 267-64.120.

Kazumi, Jiro: *See*—
Watanabe, Yoshitaka; and Kazumi, Jiro, 4,449,804, Cl. 354-418.000.

Kearney & Trecker Corporation: *See*—
Lohneis, Earl R.; and Stobbe, Richard E., 4,449,866, Cl. 408-9.000.

Kell, Ralph W., to Goodyear Tire & Rubber Company, The. Anti-backbend belts. 4,449,627, Cl. 198-847.000.

Kelleher, Kevin C., to RCA Corporation. Stepper motor drive circuit. 4,450,394, Cl. 318-696.000.

Kelly, Pilar P., to OLIN Corporation. Process for removing aluminum and silica from alkali metal halide brine solutions. 4,450,057, Cl. 204-98.000.

Kelly, Thomas L. Fire barrier reservoir. 4,449,336, Cl. 52-105.000.

Kemmner, Ulrich, to Robert Bosch GmbH. Aggregate for supplying fuel from supply container to internal combustion engine. 4,449,891, Cl. 417-423.00R.

Kemp Furniture Industries, Inc.: *See*—
Shook, James G., 4,449,766, Cl. 312-348.000.

Kendall Company, The: *See*—
Schweizer, Russell J., 4,449,969, Cl. 604-322.000.

Kendall, David P.: *See*—
Homan, Clarke G.; Kendall, David P.; and MacCrone, Robert K., 4,450,086, Cl. 252-62.510.

Kendall, James M., Jr.: *See*—
Wang, Taylor G.; Elleman, Daniel D.; and Kendall, James M., Jr., 4,449,901, Cl. 425-6.000.

Kendrick, George B.; Duggan, George L.; and Ochoa, Carlos, to GTE Products Corporation. Tungsten-halogen lamp with preferential tungsten deposition site. 4,450,381, Cl. 313-579.000.

Kenmotsu, Isami: *See*—
Ikedo, Yuji; Kenmotsu, Isami; and Isobe, Nobuyuki, 4,450,549, Cl. 369-75.100.

Kenworthy, Samuel P., to Basic Machinery Co., Inc. Die-cut brick machine for special brick shapes. 4,449,909, Cl. 425-296.000.

Kenyon, Stephen C.; Simkins, Laura J.; Brown, Leroy L.; and Sebastian, Richard, to Ensco, Inc. Broadcast signal recognition system and method. 4,450,531, Cl. 364-604.000.

Kersey, Melvin L., to Darling Store Fixtures. Display fixture mounting bracket. 4,449,686, Cl. 248-215.000.

Kessler, Juergen, to Hilti Aktiengesellschaft. Peg for engagement in countersunk section of a bore. 4,449,877, Cl. 411-57.000.

Kesting, Robert E., to Puropore, Inc. High strength nylon blend membranes. 4,450,126, Cl. 264-41.000.

Kidwell, Louis E., Jr.; and Holcomb, Dysart E., to Pennzoil Company. Method for upgrading diene-containing hydrocarbon mixtures. 4,450,069, Cl. 208-255.000.

Kihira, Kazuhide: *See*—
Sone, Shigeru; Ikuta, Yasuhiro; Komiya, Kazuaki; Kihira, Kazuhide; and Mizuno, Nobutaka, 4,449,371, Cl. 60-611.000.

Kikuchi, Hideo; Ikeda, Sunao; Kakitani, Yohtaro; Hibi, Kunio; and Okuzawa, Tugio, to Ricoh Company, Ltd. Collating apparatus for copying machine. 4,449,813, Cl. 355-14.00R.

Kikuchi, Masahiro; Utena, Hisashi; and Takei, Shinzo, to Sony Corporation. Cathode ray tube. 4,450,379, Cl. 313-477.0HC.

Kikuchi, Mitsuru: *See*—
Fujii, Yasuhiko; Kikuchi, Mitsuru; and Saito, Hiroyuki, 4,450,490, Cl. 360-13.000.

Kim, Bongsub: *See*—
Kaneko, Thomas M.; Dutton, Daniel R.; and Kim, Bongsub, 4,450,001, Cl. 71-118.000.

Kim, Han J.; and Bevington, Richard C., to GTE Products Corporation. Silver material suitable for backing of silver-cadmium oxide contacts and contacts employing same. 4,450,204, Cl. 428-552.000.

Kimble, James B.: *See*—
Eastman, Alan D.; and Kimble, James B., 4,450,313, Cl. 585-624.000.

Kimura, Takeshi: *See*—
Fujiwara, Hideo; Kudo, Mitsuhiro; Tamura, Teizo; Sugishita, Nobuyuki; Shiroishi, Yoshihiro; Kimura, Takeshi; Shinagawa, Kiminari; and Kumasaka, Noriyuki, 4,450,494, Cl. 360-125.000.

Kimura, Tomohiko: *See*—
Araki, Kazuhiko; Ao, Hideki; Kimura, Tomohiko; and Aihara, Kenichi, 4,450,165, Cl. 424-258.000.

Kimura, Wayne D., to United States of America, Navy. Vacuum tight window through which a high power laser beam and a high energy particle beam can be transmitted within close proximity to each other. 4,449,789, Cl. 350-319.000.

Kimura, Yasuhiro: *See*—
Uyehara, Norioki; Abe, Susumu; and Kimura, Yasuhiro, 4,450,006, Cl. 75-125.000.

Kin, Chinei. Cooling system for water-cooled engines for vehicles. 4,449,486, Cl. 123-41.290.

Kinder, David B.: *See*—
Pilat, John F.; Czerniakiewicz, Anastasia J.; Kinder, David B.; and Davidian, Gary, 4,450,523, Cl. 364-200.000.

Kindig, Alan L., to General Electric Company. Automatic system and method for compressing coil turns and inserting insulators in slots of a slotted stator core. 4,449,289, Cl. 29-596.000.

King Coal Furnace Corporation: *See*—
Robb, Michael F., 4,449,462, Cl. 110-288.000.

King Jim Co., Ltd.: *See*—
Ohminato, Kiyoshi, 4,449,840, Cl. 402-34.000.

Kinney, James, to Clairol Incorporated. Thickened alpha-olefin sulfonate containing formulations. 4,450,090, Cl. 252-106.000.

Kirby, Dorothy Y. Universal stitching guide. 4,449,465, Cl. 112-153.000.

Kirchbrucher, Rudiger: *See*—
Becker, Kunibert; Elsner, Burckhard; and Kirchbrucher, Rudiger, 4,449,860, Cl. 405-293.000.

Kish, Lewis L.: *See*—
Ames, S. Leslie; Gray, Thomas H.; and Kish, Lewis L., 4,450,206, Cl. 428-606.000.
Kishi, Norimasa; Noso, Kazunori; and Takeuchi, Yasuhisa, to Nissan Motor Co., Ltd. Voice responsive door lock system for a motor vehicle. 4,450,545, Cl. 367-198.000.
Kitada, Toyofumi: *See*—
Suga, Katsuyuki; Kitada, Toyofumi; Naganawa, Yutaka; and Nakagawa, Hirotaka, 4,450,018, Cl. 148-26.000.
Kitamura, Masafumi: *See*—
Kudo, Toshiyuki; Itoh, Kazuo; and Kitamura, Masafumi, 4,450,551, Cl. 369-173.000.
Kitamura, Takashi; Watanabe, Asao; Nakano, Takashi; Masaki, Katsumi; Hirayama, Kazuhiro; Sato, Yasushi; and Tokiwa, Taisuke, to Canon Kabushiki Kaisha. Overlay recording device for recording a plurality of information in superimposition. 4,450,453, Cl. 346-108.000.
Kitao, Teijiro; Setsune, Jun-ichiro; Ishihara, Shoichi; and Yamamoto, Ryoichi, to Matsushita Electric Industrial Co., Ltd. Sunlight-energy-storing method. 4,449,516, Cl. 126-430.000.
Kitawaki, Michio; and Annaka, Masao, to Mutsubishi Rubber Co., Ltd. Sealing mechanism for bearings. 4,449,717, Cl. 277-153.000.
Kitayama, Takeo: *See*—
Mokuya, Hiroichi; Yokko, Masao; Komatsu, Hiroyuki; Suzuki, Katsuhisa; and Kitayama, Takeo, 4,449,496, Cl. 123-198.00F.
KIWI Coders Corporation: *See*—
Siegal, Burton L., 4,450,375, Cl. 310-331.000.
Klee, Heinz, to ITT Industries, Inc. Control system for adjusting a physical quantity. 4,450,518, Cl. 364-183.000.
Klein, Gerald W.; Snow, Robert A.; and Sutton, Richard C., to Eastman Kodak Company. Polymeric mordants. 4,450,224, Cl. 430-213.000.
Klein, Imrich: *See*—
Sienkiewicz, Boleslaw; Kramer, Franklin; Klein, Imrich; Oldershaw, C. G. Peter; and Chuang, Locus Y., 4,449,906, Cl. 425-131.100.
Kleinert, Dieter: *See*—
Fuhrer, Egon; Kleinert, Dieter; Pfrogner, Gerd; and Egg, Max, 4,449,691, Cl. 251-85.000.
Klepeis, John E., to Stauffer Chemical Company. Process for the removal of SO_2 from gas streams. 4,450,145, Cl. 423-242.000.
Klepeis, John E., to Stauffer Chemical Company. Heat recovery in P_2O_5 production process. 4,450,146, Cl. 423-304.000.
Klepper, Robert; and Bomar, Daryld W., to Energy 2000, Inc. Hydraulic operated surface pumping unit. 4,449,896, Cl. 417-399.000.
Kliger, Isaac E.; Brown, William C., Jr.; and Goldstein, David S., to Raytheon Company. Phase-lock loop control circuitry. 4,450,410, Cl. 328-155.000.
Kline, Michael S. Golf clip. 4,449,310, Cl. 40-11.00R.
Knabel, Walter; Wagner, Ludwig; and Richert, Manfred, to Marker-Patentverwertungsgesellschaft mbH. Heel holder for safety ski bindings. 4,449,731, Cl. 280-632.000.
Knaggs, Roy E. Driver for Allen head screws. 4,449,722, Cl. 279-62.000.
Knill, Edmund C.: *See*—
Chessin, Hyman; and Knill, Edmund C., 4,450,050, Cl. 204-41.000.
Knorr-Bremse GmbH: *See*—
Eder, Herbert, 4,449,759, Cl. 303-38.000.
Kobayashi, Hiroshi, to Nissan Motor Co., Ltd. Liquid quantity sensor of capacitor type. 4,450,501, Cl. 361-284.000.
Kobayashi, Katsumi, to Sony Corporation. Color video data display apparatus. 4,450,439, Cl. 340-703.000.
Kobayashi, Kimiyuki: *See*—
Fujita, Taira; Nakagawa, Hiroyuki; Sugihara, Mikio; Kobayashi, Kimiyuki; and Okamoto, Katuhiko, 4,450,114, Cl. 260-458.00C.
Kobayashi, Mikio; and Kuritani, Kingo, to Alps Electric Co., Ltd. Substrate for mounting electric parts. 4,449,769, Cl. 339-17.00C.
Kobayashi, Takashi: *See*—
Itoh, Fumikazu; Fujita, Yasuhiro; Kobayashi, Takashi; and Mifune, Takao, 4,449,293, Cl. 29-736.000.
Kamioka, Toshiharu; Nakayama, Isao; Honda, Takeo; Kobayashi, Takashi; Obata, Tokio; Fujii, Katsutoshi; Kojima, Mikio; and Akiyoshi, Yuji, 4,450,162, Cl. 424-251.000.
Kobe, Inc.: *See*—
Peterson, Daniel G.; Erickson, John W.; and Robinson, Horace M., 4,449,582, Cl. 166-64.000.
Koberstein, Edgar: *See*—
Domesle, Rainer; Volker, Herbert; Koberstein, Edgar; and Pletka, Hans-Dieter, 4,450,244, Cl. 502-185.000.
Koch, Manfred: *See*—
Dreiseitl, Walter; Koch, Manfred; and Linden, Wilhelm, 4,450,403, Cl. 324-166.000.
Kocher, Jakob; and Foerster, Michael. Binocular ophthalmoscope. 4,449,797, Cl. 351-205.000.
Kochnev, Anatoly M.: *See*—
Nikonarov, Samuil S.; Kochnev, Anatoly M.; Goldobin, Vladimir B.; Sarapulov, Jury M.; and Valdman, Isaak Y., 4,449,953, Cl. 464-19.000.
Kockler, Barry C.: *See*—
Betron, Frank A.; Davis, James W.; Kockler, Barry C.; and Spears, Lonnie K., 4,449,811, Cl. 355-3.0SH.
Kodo, Keiun. Variable venturi carburetor. 4,450,119, Cl. 261-44.00D.
Koelbl, Harold M., to PPG Industries, Inc. Hinged window closure for float glass processing chamber. 4,449,995, Cl. 65-158.000.
Koeniger, Erich A., to Barnes-Hind/Hydrocurve, Inc. Intraocular lens and method of retaining in place. 4,449,257, Cl. 3-13.000.
Koeppen, Peter L.: *See*—
Solimeno, Duane; Brown, Sammy K.; Koeppen, Peter L.; and Rogers, Gerald, 4,450,534, Cl. 364-900.000.
Koezuka, Tetsuo: *See*—
Nakashima, Masato; Koezuka, Tetsuo; and Inagaki, Takefumi, 4,450,579, Cl. 382-8.000.
Kohl, Karl, to Jablin, Morton; and Winter, Johann, part interest to each. Warp knitting machine with Jacquard attachment. 4,449,381, Cl. 66-203.000.
Kohl, Karl, to Jablin, Morton; and Winter, Johann, part interest to each. Warp knitting machine equipped with latch-type needles. 4,449,382, Cl. 66-203.000.
Kohmoto, Teruo: *See*—
Eto, Hiromichi; Kohmoto, Teruo; Kouda, Tadayuki; Ogawa, Youichiro; Sato, Susumu; Kuraishi, Tadayuki; and Nakashima, Toshiaki, 4,450,109, Cl. 260-243.300.
Kohsaka, Yasuo; Nonaka, Yoshihiro; and Tachibana, Hideo, to Nitta Gelatin Kabushiki Kaisha. Method for measuring the number of hyperfine particles and a measuring system therefor. 4,449,816, Cl. 356-37.000.
Kohzai, Yoshinori; Fujioka, Yoshiki; and Ota, Naoto, to Fujitsu Fanuc Limited. Spindle orientation control apparatus. 4,450,393, Cl. 318-592.000.
Koide, Hajime, to Victor Company of Japan, Limited. Televison camera and remote-controllable video signal recording/reproducing apparatus. 4,450,487, Cl. 358-335.000.
Koizumi, Hideaki; Yamada, Hideo; and Oishi, Kounosuke, to Hitachi, Ltd. Zeeman atomic absorption spectrophotometer. 4,449,820, Cl. 356-307.000.
Kojima, Mikio: *See*—
Kamioka, Toshiharu; Nakayama, Isao; Honda, Takeo; Kobayashi, Takashi; Obata, Tokio; Fujii, Katsutoshi; Kojima, Mikio; and Akiyoshi, Yuji, 4,450,162, Cl. 424-251.000.
Kojima, Tadashi: *See*—
Arai, Norikazu; Ishiyama, Shozo; and Kojima, Tadashi, 4,449,792, Cl. 350-432.000.
Kollmorgen Technologies Corporation: *See*—
Nuzzi, Francis J.; Leech, Edward J.; Charm, Richard W.; and Polichette, Joseph, 4,450,190, Cl. 427-304.000.
Komai, Koichiro: *See*—
Iwamura, Junichi; and Komai, Koichiro, 4,449,997, Cl. 71-88.000.
Komatsu, Hiroyuki: *See*—
Mokuya, Hiroichi; Yokko, Masao; Komatsu, Hiroyuki; Suzuki, Katsuhisa; and Kitayama, Takeo, 4,449,496, Cl. 123-198.00F.
Komatsu, Tatsuyoshi; Numata, Shigeaki; and Maruyama, Kazuhiro, to Kawasaki Kasei Chemicals Ltd. Process for the purification of anthraquinone. 4,450,111, Cl. 260-369.000.
Komiya, Kazuaki: *See*—
Sone, Shigeru; Ikuta, Yasuhiro; Komiya, Kazuaki; Kihira, Kazuhide; and Mizuno, Nobutaka, 4,449,371, Cl. 60-611.000.
Koncelik, Kenneth J.; and Goetter, Erwin H., to Preformed Line Products Company. Shield connector. 4,4<9,768, Cl. 339-14.00R.
Kondow, Takeshi; Okazaki, Koshi; Katsuhara, Yutaka; and Matsuoka, Kimiaki, to Central Glass Company, Limited. Vapor phase catalytic hydrolysis of benzal chloride or its halogen- or trifluoromethyl-substitute to form benzaldehyde or substitute. 4,450,298, Cl. 568-437.000.
Koninger, Horst: *See*—
Geyken, Erwin; Koninger, Horst; and Schirk, Gunter, 4,449,278, Cl. 29-132.000.
Konishi, Tadashi: *See*—
Nakatani, Nobuji; Inatani, Reiko; and Konishi, Tadashi, 4,450,097, Cl. 252-404.000.
Konishiroku Photo Industry Co., Ltd.: *See*—
Arai, Norikazu; Ishiyama, Shozo; and Kojima, Tadashi, 4,449,792, Cl. 350-432.000.
Haneda, Satoshi; Itoh, Takashi; Nakamura, Ken; and Tomono, Makoto, 4,450,220, Cl. 430-102.000.
Shimba, Satoru; Ito, Kenji; Tsuda, Yasuo; and Sugita, Hiroshi, 4,450,228, Cl. 430-505.000.
Takei, Yoshiaki; Fujimaki, Yoshihide; and Nomori, Hiroyuki, 4,450,218, Cl. 430-59.000.
Tamura, Takashi, 4,449,809, Cl. 355-3.0DR.
Terada, Sadatugu; Haneda, Satoshi; Tomono, Makoto; and Matsuo, Syunji, 4,450,221, Cl. 430-106.600.
Konomura, Yutaka; and Omagari, Yasuhiko, to Olympus Optical Co., Ltd. Disinfection indicator for medical equipment. 4,449,518, Cl. 128-4.000.
Konrad, Michael W.; and Lin, Leo S., to Cetus Corporation. Process for recovering human IFN-β from a transformed microorganism. 4,450,103, Cl. 260-112.00R.
Kopec, Eduard; and Oberknapp, Wolfgang, to Filterwerk Mann & Hummel GmbH. Slosh baffle for oil pan of internal combustion engine. 4,449,493, Cl. 123-196.00A.
Kopecky, Ivyl D.: *See*—
Morlock, Ruben D.; Kopecky, Ivyl D.; Anderson, Robert R.; and Marcy, Dewey R., 4,449,672, Cl. 241-101.700.
Korean Advanced Institute of Science and Technology: *See*—
Park, Sang-Woo, 4,450,274, Cl. 546-262.000.
Korpman, Ralf, to Johnson & Johnson. Absorbent products, processes and compositions. 4,449,977, Cl. 604-366.000.
Korsgaard, Ebbe. Method and a system for treating large straw bales, particularly round bales, with ammonia or other lye agents. 4,450,178, Cl. 426-69.000.
Korsunsky, Iosif: *See*—
Grabbe, Dimitry G.; and Korsunsky, Iosif, 4,449,770, Cl. 339-17.0CF.

Korth, Hans-Erdmann, to International Business Machines Corporation. Modular, optical fiber communication system. 4,449,782, Cl. 350-96.160.

Korwin, Paul; and Korwin, Robert. Dental container and amalgam dispensing method. 4,449,645, Cl. 222-49.000.

Korwin, Robert: *See*—
Korwin, Paul; and Korwin, Robert, 4,449,645, Cl. 222-49.000.

Koto, Haruhiko, to Epson Corporation; and Kabushiki Kaisha Suwa Seikosha. Small size ink jet printer. 4,450,454, Cl. 346-140.00R.

Kouda, Tadayuki: *See*—
Eto, Hiromichi; Kohmoto, Teruo; Kouda, Tadayuki; Ogawa, Youichiro; Sato, Susumu; Kuraishi, Tadayuki; and Nakashima, Toshiaki, 4,450,109, Cl. 260-243.300.

Kovach, Stephen M.: *See*—
Hettinger, William P., Jr.; Kovach, Stephen M.; and Hoffman, James F., 4,450,241, Cl. 502-34.000.

Kovacs, Gabor: *See*—
Soos, Rudolf; Nemes, Jozsef; Vidra, Laszlo; Szelestei, Miklos; Kovacs, Gabor; and Szekeley, Istvan, 4,450,309, Cl. 570-217.000.

Krahn, Heinrich: *See*—
Northemann, Karl-Heinz; and Krahn, Heinrich, 4,449,266, Cl. 15-167.00A.

Krakovsky, Rafael. Long life gate valve. 4,449,547, Cl. 137-330.000.

Kramer, Franklin: *See*—
Sienkiewicz, Boleslaw; Kramer, Franklin; Klein, Imrich; Oldershaw, C. G. Peter; and Chuang, Locus Y., 4,449,906, Cl. 425-131.100.

Kramert, Arthur R. Heat recovery system. 4,449,571, Cl. 165-1.000.

Kraus, Thaddaus, to Balzers Aktiengesellschaft. Arrangement for coating substrates by vacuum deposition. 4,449,478, Cl. 118-720.000.

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Kritz, Jacob A., to Sperry Corporation. Multiple beam lens transducer for sonar systems. 4,450,542, Cl. 367-150.000.

Krob, Erwin; and Bauer, Helmut, to TMC Corporation. Ski brake. 4,449,729, Cl. 280-605.000.

Krokaugger, William G., to Mole-Richardson Company. DC Light dimmer control system. 4,450,384, Cl. 315-127.000.

Krow, Cecil J. Magnetic oil filter insert. 4,450,075, Cl. 210-223.000.

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Kruger, Christian. Stomach flushing devices. 4,449,972, Cl. 604-96.000.

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Kubicek, Donald H.: *See*—
Lindstrom, Merlin R.; Macdonell, Gary D.; Louthan, Rector P.; and Kubicek, Donald H., 4,450,102, Cl. 252-542.000.

Kubo, Kazuhiro: *See*—
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Kudo, Mitsuhiro: *See*—
Fujiwara, Hideo; Kudo, Mitsuhiro; Tamura, Teizo; Sugishita, Nobuyuki; Shiroishi, Yoshihiro; Kimura, Takeshi; Shinagawa, Kiminari; and Kumasaka, Noriyuki, 4,450,494, Cl. 360-125.000.

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Kuipers, Warren W.: *See*—
Hays, Herbert G.; and Kuipers, Warren W., 4,449,511, Cl. 126-110.00R.

Kukes, Semyon, to Phillips Petroleum Company. Demetallization of hydrocarbon containing feed streams. 4,450,068, Cl. 208-251.00H.

Kumagai, Atsuhiro: *See*—
Ohta, Shuichi; and Kumagai, Atsuhiro, 4,449,677, Cl. 242-199.000.

Kumasaka, Noriyuki: *See*—
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Yamaguchi, Kazuo; Kuni, Asahiro; Akiyama, Nobuyuki; and Endo, Juro, 4,449,818, Cl. 356-237.000.

Kunii, Takao: *See*—
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Kunkel, Heinrich: *See*—
Olschewski, Armin; Laszlofalvi, Zoltan; and Kunkel, Heinrich, 4,449,421, Cl. 74-516.000.

Kunzle, Franz M.: *See*—
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Kurahashi, Kazuo: *See*—
Takamura, Masayuki; and Kurahashi, Kazuo, 4,450,210, Cl. 428-660.000.

Kurahayashi, Takahisa, to Matsushita Reiki Co., Ltd. Refrigerant compressor. 4,449,895, Cl. 417-368.000.

Kuraishi, Tadayuki: *See*—
Eto, Hiromichi; Kohmoto, Teruo; Kouda, Tadayuki; Ogawa, Youichiro; Sato, Susumu; Kuraishi, Tadayuki; and Nakashima, Toshiaki, 4,450,109, Cl. 260-243.300.

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Iwato, Susumu; Nakamura, Tatuo; and Kurauchi, Takeo, 4,450,200, Cl. 428-323.000.

Kurihara, Osamu: *See*—
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Kurihashi, Isao: *See*—
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Kurimoto Iron Works, Ltd.: *See*—
Takeuchi, Shigeru, 4,450,128, Cl. 264-70.000.

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Yamada, Takeyoshi; Kurisu, Shizuka; Azuma, Shizuo; Kawase, Shoji; and Sano, Makoto, 4,449,992, Cl. 55-158.000.

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Kobayashi, Mikio; and Kuritani, Kingo, 4,449,769, Cl. 339-17.00C.

Kuroda, Nobuyuki: *See*—
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Kuroiwa, Katsumasa: *See*—
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Kurtz, Stuart J.; De Rossett, Terry A.; and Shaw, Montgomery T., to Union Carbide Corporation. Pheological measurement method and apparatus. 4,449,395, Cl. 73-56.000.

KV33 Corporation: *See*—
Huffman, Ronald E., 4,449,930, Cl. 433-64.000.

Kwon, Tae M.; and Debley, William P., to Litton Systems, Inc. Magnetic resonance cell and method for its fabrication. 4,450,407, Cl. 324-304.000.

Kyhl, Henry: *See*—
De Longis, Vincent E.; and Kyhl, Henry, 4,449,800, Cl. 353-119.000.

Kyoto Ceramic Co., Ltd.: *See*—
Saito, Koji, 4,449,931, Cl. 433-74.000.

Kyoto University: *See*—
Morimoto, Takeshi, 4,450,460, Cl. 357-17.000.

Kyowa Hakko Kogyo Co., Ltd.: *See*—
Takizawa, Hiroshi; Oiji, Yoshimasa; and Kubo, Kazuhiro, 4,450,115, Cl. 260-465.00E.

Lackey, Robert S.: *See*—
Draper, Robert; Lackey, Robert S.; Fagan, Thomas J., Jr.; Veyo, Stephen E.; and Humphrey, Joseph R., 4,449,376, Cl. 62-259.100.

Ladek Corporation: *See*—
Lambert, Roland, 4,449,572, Cl. 165-1.000.

Laferty, John M.; Queneau, Paul B.; and Beckstead, Leo W., to Amax Inc. Ammonium hydroxide stripping of tungsten from organic solvents. 4,450,144, Cl. 423-54.000.

Lafferty, Edwin C.; and Gibson, James H., to General Electric Company. Discriminator circuit for frequency modulation receivers. 4,450,590, Cl. 455-214.000.

Laitem, Leopold: *See*—
Broze, Guy; and Laitem, Leopold, 4,450,089, Cl. 252-95.000.

Lake, Ivan J. S.; and Whittam, Thomas V., to Imperial Chemical Industries PLC. Hydrocarbon conversion. 4,450,312, Cl. 585-481.000.

Lambeck, Raymond P., to Vickers, Incorporated. Power transmission. 4,449,898, Cl. 418-61.00B.

Lambert, Frederick J.; Bosack, Donald J.; and Johansen, David K., to GNB Batteries Inc. Control circuit for automatic battery chargers. 4,450,401, Cl. 320-22.000.

Lambert, Mark A.: *See*—
Dudek, David M.; and Lambert, Mark A., 4,450,136, Cl. 420-590.000.

Lambert, Roland, to Ladek Corporation. Subterranean heating and cooling system. 4,449,572, Cl. 165-1.000.

Lampman, William T., to Whirlpool Corporation. Dishrack wheel assembly for a dishwasher. 4,449,765, Cl. 312-311.000.

Land O'Lakes, Inc.: *See*—
Stahel, Nancy G., 4,450,176, Cl. 426-2.000.

Landis, Dan R.: *See*—
Williams, Paul; and Landis, Dan R., 4,450,404, Cl. 324-226.000.

Lane, David, to AMP Incorporated. Shielded electrical connector. 4,449,778, Cl. 339-143.00R.

Lane, Garnett S. Fishing bobber. 4,449,318, Cl. 43-44.900.

Lane, Joseph E. Removable tire carrier. 4,449,881, Cl. 414-428.000.

Langwadt, Otmar, to Dyckerhoff & Widmann Aktiengesellschaft. Anchor head for a corrosion-protected injected anchor. 4,449,855, Cl. 405-260.000.

Langwieder, Rolf; Rebmann, Rolf; Stotz, Erich; Wierschem, Franz-Rudolf; and Trick, Fred, to Dr. Ing. h.c.F. Porsche AG. Suspension for a front, especially a transversely-mounted motor vehicle power plant. 4,449,603, Cl. 180-232.000.

Lankin, David C.: *See*—
Hechenbleikner, Ingenuin; Enlow, William P.; and Lankin, David C., 4,450,113, Cl. 260-439.00R.

Lapidot, Heine: *See*—
Ritzer, Alan; and Lapidot, Heine, 4,450,282, Cl. 556-472.000.

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Larrat, Philippe: *See*—
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Larrive, Christopher: *See—*
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Larsen, Torbjorn J. Dowel for pavement joints. 4,449,844, Cl. 404-60.000.

Larson, Marlow W. Sighting screw unit for and with archery bows. 4,449,303, Cl. 33-265.000.

Larson, Robert W.; Lou, Wen C.; DeVito, Vivian C.; and Neidinger, Karen A., to General Foods Corporation. Method of producing frozen yeast-leavened dough. 4,450,177, Cl. 426-19.000.

Laszlofalvi, Zoltan: *See—*
Olschewski, Armin; Laszlofalvi, Zoltan; and Kunkel, Heinrich, 4,449,421, Cl. 74-516.000.

La Torre, Richard R.; and Phaneuf, Robert A., to Raytheon Company. Gimbal assembly for monopulse radar antenna. 4,450,451, Cl. 343-765.000.

Lauhoff, Theodor: *See—*
Barzantny, Joachim; Beske, Joachim; Hans, Rainer; and Lauhoff, Theodor, 4,449,890, Cl. 417-50.000.

Laurent, Henry: *See—*
Nickisch, Klaus; Laurent, Henry; Wiechert, Rudolf; and Casals-Stenzel, Jorge, 4,450,107, Cl. 424-238.000.

Lautenschlager, Karl; and Viniol, Gerd, to Karl Lautenschlager KG, Mobelbeschlagfabrik. Adjustable hanger for wall-hung cabinets and the like. 4,449,689, Cl. 248-544.000.

Lauterbach, Heinz, to Robert Bosch GmbH. Apparatus for measuring the mass of a pulsating medium flowing in a flow cross-section. 4,449,397, Cl. 73-118.000.

Lavanish, Jerome M.; and Van Gemert, Barry, to PPG Industries, Inc. Herbicidally active oxadiazole ureas. 4,449,998, Cl. 71-92.000.

Lawrence, Dale M.: *See—*
Auth, David C.; Lawrence, Dale M.; and Majoch, Tim R., 4,449,528, Cl. 128-303.100.

Lawrence Fell Limited: *See—*
Takeuchi, Seiji, 4,449,279, Cl. 29-401.100.

Laws, Gerald E.: *See—*
Guttag, Karl M.; and Laws, Gerald E., 4,450,519, Cl. 364-200.000.

Laws, William R.; and Reed, Geoffrey R. Fluidized bed heating apparatus. 4,449,575, Cl. 165-82.000.

Lawson, John E., to ARMCO Inc. Well devices with annulus check valve and hydraulic by-pass. 4,449,583, Cl. 166-72.000.

Lawson, John R.: *See—*
Fulmer, George G.; and Lawson, John R., 4,450,216, Cl. 430-31.000.

Layman, Jeremy: *See—*
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Lear Siegler, Inc.: *See—*
Gabriele, Leonard A., 4,449,872, Cl. 409-252.000.
Murphy, Randall T.; and Heling, Dennis H., 4,449,751, Cl. 297-284.000.

Lebret, Gerard: *See—*
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Leco Engineering & Machine, Inc.: *See—*
Voegeli, Ronald C., 4,449,643, Cl. 221-226.000.

Ledger, Curtis G. Anti-theft vibration detector switch and system. 4,450,326, Cl. 200-61.45M.

Ledley, Robert S., to Georgetown University. Digital fluorographic method and system. 4,450,478, Cl. 358-111.000.

Lee, Jerald D., to Du Pont de Nemours, E. I., and Company. Process colorimeter. 4,449,821, Cl. 356-319.000.

Lee, Julia L.: *See—*
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Lee, Lindell E., Jr.: *See—*
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Lee Pharmaceuticals, Inc.: *See—*
Pollak, Richard B., 4,449,938, Cl. 523-116.000.

Leech, Edward J.: *See—*
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Lehnert, Stanley E., to Zenith Radio Corporation. Electronic television picture framing circuit. 4,450,386, Cl. 315-371.000.

Leibinsohn Saul. Liquid-flow measuring devices, particularly useful for drip chambers. 4,449,534, Cl. 604-51.000.

Leistner, William E.; and Overberger, Charles G., to Phoenix Chemical Corporation. Hindered piperidyl light stabilizers. 4,450,248, Cl. 524-99.000.

Leivenzon, Simon; and Leivenzon, Steven, to Firmagroup Australia Pty. Ltd. Mullion section member. 4,449,562, Cl. 160-113.000.

Leivenzon, Steven: *See—*
Leivenzon, Simon; and Leivenzon, Steven, 4,449,562, Cl. 160-113.000.

Leland Stanford Junior University, The Board of Trustees of the: *See—*
Tuckerman, David B.; and Pease, Roger F. W., 4,450,472, Cl. 357-82.000.

Leloux, Arnoldus W. J., to Wavin B.V. Apparatus for making profiled plastic tube. 4,449,910, Cl. 425-325.000.

Lemaire, Didier; and Lebret, Gerard, to E. P. Remy et Cie. Device for conveying and redistributing objects. 4,449,624, Cl. 198-412.000.

Le Martret, Odile; Humbert, Daniel; and Hunt, Peter F., to Roussel Uclaf. 3-Quinoline carboxamides having anxiolytic activity. 4,450,167, Cl. 424-258.000.

Le Martret, Odile: *See—*
Clemence, Francois; Hunt, Peter F.; Le Martret, Odile; and Humbert, Daniel, 4,450,166, Cl. 424-258.000.

Lemmon, Gerald W.: *See—*
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Lenard, Peter: *See—*
Beck, Ernst; Lenard, Peter; and Pokorny, Erich, 4,449,427, Cl. 76-77.000.

Lennon, J. Anthony: *See—*
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Leon, Albert M.; and McCoy, Daniel E., to Dorr-Oliver Incorporated. Fluidized bed boilers. 4,449,482, Cl. 122-4.0D.

Leonard, John J.: *See—*
Sofranko, John A.; and Leonard, John J., 4,450,293, Cl. 562-579.000.

Leppert, Norbert: *See—*
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Le Quement, Patrick: *See—*
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Lerner, Bernard J. Prilling. 4,449,900, Cl. 425-6.000.

Lerouge, Andre; Andre, Jean-Louis; and Coutin, Pierre, to R. Alkan & Cie; and Elf France. Device for igniting a torch. 4,449,920, Cl. 431-91.000.

Lester, J. Harvey, Jr.: *See—*
Chi, Ching T.; and Lester, J. Harvey, Jr., 4,450,291, Cl. 562-530.000.

Lett, Roland, to Flonic S.A. Axial turbine flowmeters. 4,449,410, Cl. 73-861.910.

Levenberg, Alvin: *See—*
Levenberg, Nat; and Levenberg, Alvin, 4,449,631, Cl. 206-459.000.

Levenberg, Nat; and Levenberg, Alvin. Tamper proof packaging. 4,449,631, Cl. 206-459.000.

Levolor Lorentzen, Inc.: *See—*
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Lewis, Robert M.; and Slaugh, Lynn H., to Shell Oil Company. Barium hydride modified aluminum/siliceous compositions. 4,450,099, Cl. 502-232.000.

Ley, Gregor: *See—*
Hirsch, Guenter; and Ley, Gregor, 4,450,013, Cl. 106-308.00N.

Leybold-Heraeus GmbH: *See—*
Weingartner, Ernst; and Samietz, Klaus, 4,450,570, Cl. 373-69.000.

Licentia Patent-Verwaltungs GmbH: *See—*
Dahlberg, Reinhard, 4,449,286, Cl. 29-572.000.
Ostermann, Bernd; and Lissner, Paul, 4,450,320, Cl. 179-5.00R.

Liebhardt, Josef; Fuhrer, Rudolf; and Dautel, Erich, to Messerschmitt-Boelkow-Blohm Gesellschaft mit beschraenkter Haftung. Safety mechanism for an explosive body. 4,449,454, Cl. 102-226.000.

Lightstone, Alexander W.; Eastwood, H. Keith; and Szarka, Frank, to Her Majesty the Queen in Right of Canada as represented by the Minister of National Defense. Multimode optical fiber coupler. 4,449,781, Cl. 350-96.150.

Lin, Leo S.: *See—*
Konrad, Michael W.; and Lin, Leo S., 4,450,103, Cl. 260-112.00R.

Lindauer, Jerome I., to Avon Products, Inc. Fragrant insect repellent composition and combustible candle composition containing same. 4,449,987, Cl. 44-7.500.

Linde Aktiengesellschaft: *See—*
Forster, Franz, 4,449,444, Cl. 91-506.000.

Linde, John W.: *See—*
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Linde, Ronald K., to Envirosonics, Inc. Centrifugal reaction chamber. 4,450,141, Cl. 422-225.000.

Linden, Wilhelm: *See—*
Dreiseitl, Walter; Koch, Manfred; and Linden, Wilhelm, 4,450,403, Cl. 324-166.000.

Lindner, Gerhard: *See—*
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Lindsay, Alexander, to Modern Arts Packaging, Inc. One-piece shopping bag handles. 4,450,580, Cl. 383-6.000.

Lindstrom, Merlin R.; Macdonell, Gary D.; Louthan, Rector P.; and Kubicek, Donald H., to Phillips Petroleum Company. Sulfur based metal cleaners and corrosion inhibitors. 4,450,102, Cl. 252-542.000.

Lineberger, William F.: *See—*
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Lingens, Paul: *See—*
Christmann, Wolfgang; Lindner, Gerhard; and Lingens, Paul, 4,450,124, Cl. 264-3.00R.

Linhart, Friedrich: *See—*
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Lion Corporation: *See—*
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Lioutas, Theodore S.: *See—*
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Lipe, Joel T.: *See—*
Hill, Jerry M.; and Lipe, Joel T., 4,450,529, Cl. 364-508.000.

Lisi, Edward L.; Melleby, Juul A.; and Andersson, Arne, to Exxon Research and Engineering Co. Method and apparatus for regulating fluid flows in parallel-connected conduits (e.g. in furnace installations having air preheaters and by-pass conduits). 4,449,569, Cl. 165-1.000.

Lissmann, Kurt: *See*—
Biermann, Kurt; Horlebein, Eberhard; Lissmann, Kurt; and Schafer, Wolfgang. 4,449,402, Cl. 73-204.000.

Lissner, Paul: *See*—
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Little, Roger G., to Spire Corp. Front surface metallization and encapsulation of solar cells. 4,450,033, Cl. 156-380.800.

Litton Systems, Inc.: *See*—
Gray, Robert E., 4,449,524, Cl. 128-202.270.
Kwon, Tae M.; and Debley, William P., 4,450,407, Cl. 324-304.000.

Litvin, Robert L.; and Price, David W. Waste plumbing installation and fittings therefor. 4,449,741, Cl. 285-153.000.

Livia, Michael R.: *See*—
Brooks, Robert A.; Banach, Terrance R.; Barman, Erik; and Livia, Michael R., 4,449,408, Cl. 73-643.000.

Llinas, Rodolfo R.; and Pellionisz, Andras J., to New York University. Sensorimotor coordinator. 4,450,530, Cl. 364-513.000.

Locker, Howard W. Air circulation apparatus. 4,449,570, Cl. 165-65.000.

Lockwood, Larry R., to Tektronix, Inc. Electronic filter devices. 4,450,422, Cl. 333-202.000.

Loctite Corporation: *See*—
Harris, Stephen J., 4,450,265, Cl. 526-298.000.
Melody, David P.; Grant, Seamus M.; and Martin, Francis R., 4,450,030, Cl. 156-307.300.

Lodge, Glenn R.: *See*—
Semerjian, Joseph K.; and Lodge, Glenn R., 4,449,436, Cl. 83-571.000.

Lohneis, Earl R.; and Stobbe, Richard E., to Kearney & Trecker Corporation. Servo-controlled spindle drive system. 4,449,866, Cl. 408-9.000.

Longo, Frank N.; Bader, Nicholas F., III; and Dorfman, Mitchell R., to METCO Incorporated. Hollow sphere ceramic particles for abradable coatings. 4,450,184, Cl. 427-34.000.

Lor-Al Corporation: *See*—
Tyler, Loren E., 4,449,667, Cl. 239-167.000.

Loral Corporation: *See*—
Rothman, Irwin L., 4,449,291, Cl. 29-605.000.

Lorch, Werner, to Hans Grohe GmbH & Co. Mixing valve. 4,449,551, Cl. 137-625.410.

Lorenz, Klaus: *See*—
Streit, Werner; Lorenz, Klaus; and Leppert, Norbert, 4,450,083, Cl. 252-8.600.

Lou, Wen C.: *See*—
Larson, Robert W.; Lou, Wen C.; DeVito, Vivian C.; and Neidinger, Karen A., 4,450,177, Cl. 426-19.000.

Loughman, Barbara E.: *See*—
Anderson, David J.; and Loughman, Barbara E., 4,450,159, Cl. 424-246.000.

Louthan, Rector P.: *See*—
Lindstrom, Merlin R.; Macdonell, Gary D.; Louthan, Rector P.; and Kubicek, Donald H., 4,450,102, Cl. 252-542.000.

Lovejoy, Paul T., to Allegheny Ludlum Steel Corporation. Method for producing bright stainless steel. 4,450,058, Cl. 204-145.00R.

Lover, George. Solar heater. 4,449,513, Cl. 126-416.000.

Lovett, Bruce E. Television information system. 4,450,477, Cl. 358-86.000.

Lubecki, Andrzej; Wiese, Kurt; and Winkler, Karl, to Gesellschaft mit Kernforschungszentrum Karlsruhe beschrankter Haftung. Apparatus for continuously measuring the element content in slurries. 4,450,576, Cl. 378-47.000.

Lucas Industries Limited: *See*—
Greeves, Godfrey, 4,449,501, Cl. 123-425.000.
Rath, Heinrich B.; and Thomas, Alfred W., 4,449,757, Cl. 303-6.00C.
Weilhoefer, Felicitas; Stacey, David W., deceased; and Stacey, Lesley A., legal representative, 4,450,471, Cl. 357-80.000.

Lucey, Robert E., to Contrologics Corporation. Infrared telephone extension control system. 4,450,319, Cl. 179-2.0EA.

Ludlow Industries, Inc.: *See*—
Matson, Carl G., 4,449,644, Cl. 222-3.000.

Ludtke, Dieter: *See*—
Strifler, Paul; Geissler, Heinrich; Ludtke, Dieter; Maurath, Rudolf; and Steinecke, Rudolf, 4,449,726, Cl. 280-81.00A.

Luke, Roger D.; and Rhodes, John M., to Siemens-Allis, Inc. Method of forming electric distribution panel. 4,449,296, Cl. 29-883.000.

Lunn, William H. W., to Eli Lilly and Company. Dioximino cephalosporin antibiotics. 4,450,270, Cl. 544-24.000.

Lunquist, Richard E.: *See*—
Strobel, Russell A.; Rihani, Jawdat; and Lunquist, Richard E., 4,450,583, Cl. 455-86.000.

Luque, Tom R. Electro-mechanical hand controller. 4,450,325, Cl. 200-52.00R.

Luscomb, Douglas A., to Bendix Corporation, The. Fuel injection pump. 4,449,503, Cl. 123-447.000.

Lustig, Leopold P. Contra-angle head for dentistry. 4,449,932, Cl. 433-126.000.

Luther Medical Products, Inc.: *See*—
Luther, Ronald B., 4,449,973, Cl. 604-161.000.

Luther, Ronald B., to Luther Medical Products, Inc. Small gauge, pre-split cannula and process for manufacture. 4,449,973, Cl. 604-161.000.

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Luyten, Jacobus H., to Helmes Machinefabriek B.V. Device for transferring articles. 4,449,555, Cl. 144-198.00R.

M&T Chemicals Inc.: *See*—
Chessin, Hyman; and Knill, Edmund C., 4,450,050, Cl. 204-41.000.
McMullen, Warren H.; Chessin, Hyman; and Siracusa, Denise, 4,450,052, Cl. 204-51.000.

Maas, Henricus G. R.; and Appels, Johannes A., to U.S. Philips Corporation. Method of providing a narrow groove or slot in a substrate region, in particular a semiconductor substrate region. 4,449,287, Cl. 29-580.000.

Macaulay, Alexander, to Raytheon Company. Sputtering apparatus and methods. 4,450,062, Cl. 204-298.000.

MacCrone, Robert K.: *See*—
Homan, Clarke G.; Kendall, David P.; and MacCrone, Robert K., 4,450,086, Cl. 252-62.510.

Macdonell, Gary D.: *See*—
Lindstrom, Merlin R.; Macdonell, Gary D.; Louthan, Rector P.; and Kubicek, Donald H., 4,450,102, Cl. 252-542.000.

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Hertel, Richard J.; and MacIntosh, Edward D., 4,449,885, Cl. 414-750.000.

MacMillan, William R., to Tigihman Wheelabrator Limited. Shot blasting machinery. 4,449,331, Cl. 51-425.000.

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Miyoshi, Tadahiko; Yamazaki, Takeo; Maeda, Kunihiro; Takahashi, Ken; and Oowada, Siniti, 4,450,426, Cl. 338-21.000.

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Brooks, Robert A.; Banach, Terrance R.; Barman, Erik; and Livia, Michael R., 4,449,408, Cl. 73-643.000.
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Magnusson, Robert A., to Simmons U.S.A. Corp. Bed mattress having an improved pillow top. 4,449,261, Cl. 5-465.000.

Maier, Albert: *See*—
Steinsberger, Karl; Maier, Albert; and Herrmann, Walter, 4,449,868, Cl. 408-138.000.

Maier, Josef. Concrete form and method of assembling and dismantling the same. 4,450,120, Cl. 264-31.000.

Maier, Kurt, to BHS-Dr. Ing. Hofler Maschinenbau GmbH. Device for the manufacture of gear wheels for low noise gearings. 4,449,869, Cl. 409-11.000.

Maitre, Xavier: *See*—
Petit, Jean-Pierre; and Maitre, Xavier, 4,450,533, Cl. 364-724.000.

Majoch, Tim R.: *See*—
Auth, David C.; Lawrence, Dale M.; and Majoch, Tim R., 4,449,528, Cl. 128-303.100.

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Makley, James A.: *See*—
Hamisch, Paul H., Jr.; and Makley, James A., 4,450,035, Cl. 156-384.000.

Malecki, Edward S.: *See*—
Gilbride, Andrew J.; Malecki, Edward S.; Winslow, Edward H., III; and Coleman, Robert F., 4,449,463, Cl. 112-121.260.

Maledon, Susan D. Hair trimming shears. 4,449,300, Cl. 30-230.000.

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Mallett, A. J., to Halliburton Company. Swept energy source acoustic logging system. 4,450,540, Cl. 367-41.000.

Malzahn, Dale E., to Penwalt Corporation. Process for recovering anhydrous alkanesulfonic acids by reduced pressure, falling film evaporation. 4,450,047, Cl. 203-15.000.

Manabe, Harukazu: *See*—
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Mani, Ramani, to General Electric Company. Method and apparatus for promoting a surge condition in a gas turbine. 4,449,358, Cl. 60-39.020.

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Helm, Percy R.; and Morrow, James G., Sr., 4,449,635, Cl. 212-196.000.

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Colditz, Werner, 4,449,435, Cl. 83-167.000.

Manning, Donald R. Apparatus for remote closing of fuse circuits. 4,450,425, Cl. 337-171.000.

Mansell, George B., to Rapid Packaging Services Pty. Ltd. Rapid plate mounter. 4,449,452, Cl. 101-382.0MV.

Mansour, Maher L., to Ashland Oil, Inc. Mixing apparatus. 4,449,828, Cl. 366-147.000.

Manville Service Corporation: *See*—
Hounsel, Mack A.; and Byrd, Carlisle O., Jr., 4,449,345, Cl. 52-506.000.
Johnson, Harold D.; Sherman, Earle C.; and Cooper, Leonard M., 4,449,633, Cl. 206-612.000.

Maquinas Npu Ltda.: *See*—
Copia, Carlos R. D. S., 4,449,962, Cl. 493-209.000.
Marcantonio, Angelo R., to RCA Corporation. Linear velocity control means. 4,450,552, Cl. 369-240.000.
Marchetti, Renato; Penco, Eugenio; and Perito, Ugo, to Selenia, Industrie Elettroniche Associate, S.p.A. Pre-ionizing trigger system for a gas laser. 4,450,566, Cl. 372-38.000.
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Morlock, Ruben D.; Kopecky, Ivyl D.; Anderson, Robert R.; and Marcy, Dewey R., 4,449,672, Cl. 241-101.700.
Marien, Hendricus C. J.; and Thompson, Michael N., to U.S. Philips Corporation. Electron microscope comprising an X-ray detector. 4,450,355, Cl. 250-310.000.
Mariol, James F., to Suzi Stone Enterprises, Inc. Personal security device. 4,449,474, Cl. 116-2.000.
Maritec Corporation: *See*—
Baker, Kenneth R.; and De Vault, Robert T., 4,449,944, Cl. 440-47.000.
Marker, Hannes; and Huss, Otto, to Marker, Hannes. Sailboard. 4,449,466, Cl. 114-91.000.
Marker-Patentverwertungsgesellschaft mbH: *See*—
Knabel, Walter; Wagner, Ludwig; and Richert, Manfred, 4,449,731, Cl. 280-632.000.
Markham, John D., to Associated Electrical Industries Limited. Dynamic braking of direct current motors. 4,450,388, Cl. 318-87.000.
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Davies, Evan; and Marmon, John C., Jr., 4,449,259, Cl. 4-415.000.
Marshall, Charles W.; Lineberger, William F.; and Parker, Samuel A., Jr., to Parker Tobacco Company. Separation of lamina from stems in baled tobacco. 4,449,540, Cl. 131-290.000.
Martel, Jacques: *See*—
Nezot, Francois; Girault, Pierre; Tessier, Jean; and Martel, Jacques, 4,450,169, Cl. 424-270.000.
Martel, Thomas J.: *See*—
Bowen, Robert F.; and Martel, Thomas J., 4,450,334, Cl. 219-10.55E.
Martin, Francis R.: *See*—
Melody, David P.; Grant, Seamus M.; and Martin, Francis R., 4,450,030, Cl. 156-307.300.
Martin, Henry: *See*—
Fory, Werner; Martin, Henry; and Pissiotas, Georg, 4,450,000, Cl. 71-105.000.
Sturm, Elmar; Schempp, Heinrich; and Martin, Henry, 4,449,999, Cl. 71-73.000.
Martinek, Thomas W., to Teepak, Inc. Zero runout counter-rotating film extruder. 4,450,131, Cl. 264-209.200.
Martinez, Richard A.: *See*—
Fukukura, Kazutoyo; and Martinez, Richard A., 4,450,324, Cl. 200-5.00A.
Martinez-Vera, Enrique R.; and Guerra-Garcia, Gilberto, to Hylsa, S.A. Apparatus for separating agglomerated particulate matter. 4,449,671, Cl. 241-36.000.
Martinmaas, Werner W. Hand tool with handle storage of interchangeable elements. 4,449,559, Cl. 145-62.000.
Marusiak, Frank, Jr. Tamper-proof package and method. 4,449,632, Cl. 206-540.000.
Maruyama, Kazuhiro: *See*—
Komatsu, Tatsuyoshi; Numata, Shigeaki; and Maruyama, Kazuhiro, 4,450,111, Cl. 260-369.000.
Masaki, Katsumi: *See*—
Kitamura, Takashi; Watanabe, Asao; Nakano, Takashi; Masaki, Katsumi; Hirayama, Kazuhiro; Sato, Yasushi; and Tokiwa, Taisuke, 4,450,453, Cl. 346-108.000.
Masayuki, Mitsuhashi: *See*—
Takashi, Nogami; and Masayuki, Mitsuhashi, 4,449,774, Cl. 339-59.00M.
Massa, Donald P., to Stoneleigh Trust, The, Fred M. Dellorfano, Jr. and Donald P. Massa, Trustees. Acoustic alarm repeater system. 4,450,436, Cl. 340-531.000.
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Thornton, Richard D., 4,450,396, Cl. 318-721.000.
Massey, Edwin M.: *See*—
Holbert, Kenneth W.; and Massey, Edwin M., 4,450,029, Cl. 156-250.000.
Massey, William A., to General Electric Company. Voltage to frequency converter. 4,450,532, Cl. 364-703.000.
Mastro, Paul F.: *See*—
Hobart, Ralph J.; Rupp, Robert D.; and Mastro, Paul F., 4,449,694, Cl. 251-171.000.
Masuho, Yasuhiko; and Hara, Takeshi, to Teijin Limited. Antitumor hybrid and process for the preparation thereof. 4,450,154, Cl. 260-112.00R.
Mathias, Joseph S.: *See*—
Mittal, Faquir C.; and Mathias, Joseph S., 4,450,505, Cl. 361-386.000.
Mathis, Paul; and Wachter, Anton, to Mathis Systemtechnik GmbH; and Wachter KG Baustoffwerk. Apparatus for preparing mortar or the like. 4,449,826, Cl. 366-13.000.
Mathis Systemtechnik GmbH: *See*—
Mathis, Paul; and Wachter, Anton, 4,449,826, Cl. 366-13.000.
Matson, Carl G., to Ludlow Industries, Inc. Blast aerator for fluidizing granular material. 4,449,644, Cl. 222-3.000.
Matsubayashi, Kazuyuki: *See*—
Sakoda, Yasuhiro; and Matsubayashi, Kazuyuki, 4,450,344, Cl. 219-400.000.
Matsuda, Hiroto: *See*—
Sugitani, Hiroshi; Ozawa, Masakazu; Matsuda, Hiroto; Ikeda, Masami; and Matsumoto, Haruyuki, 4,450,455, Cl. 346-140.0PQ.
Matsuda, Minoru, to Nissan Motor Company, Limited. Lift device. 4,449,614, Cl. 187-9.00R.
Matsui, Shigetomo: *See*—
Yoshida, Toshio; Matsui, Shigetomo; and Atsuta, Toshio, 4,449,281, Cl. 29-421.00R.
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Sugitani, Hiroshi; Ozawa, Masakazu; Matsuda, Hiroto; Ikeda, Masami; and Matsumoto, Haruyuki, 4,450,455, Cl. 346-140.0PQ.
Matsumoto, Seiji: *See*—
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Matsumoto, Shotaro: *See*—
Itaba, Takeshi; Matsumoto, Shotaro; and Abe, Takeshi, 4,450,205, Cl. 428-552.000.
Matsumoto, Sigemi; and Nagoshi, Fumiya, to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha. Process for producing thermoplastic resin. 4,450,256, Cl. 525-316.000.
Matsumura, Kaname, to Mitsuboshi Belting Ltd. Cross grooved banded drive belt. 4,449,959, Cl. 474-238.000.
Matsunaga, Kenichi: *See*—
Yoshikumi, Chikao; Ohmura, Yoshio; Hirose, Fumio; Ikuzawa, Masanori; Matsunaga, Kenichi; Fujii, Takayoshi; Ohhara, Minoru; and Ando, Takao, 4,450,156, Cl. 424-180.000.
Matsunami, Keiichi: *See*—
Sato, Hideo; Goto, Yasuyuki; Saito, Hideo; Sawada, Shinichi; Matsunami, Keiichi; and Hirata, Kohzo, 4,450,094, Cl. 252-299.610.
Matsuo, Seitaro: *See*—
Ono, Toshiro; and Matsuo, Seitaro, 4,450,031, Cl. 156-345.000.
Matsuo, Syunji: *See*—
Terada, Sadatugu; Haneda, Satoshi; Tomono, Makoto; and Matsuo, Syunji, 4,450,221, Cl. 430-106.600.
Matsuo, Tohru; and Aoki, Takeo, to Sumitomo Kinzoku Kogyo Kabushiki Kaisha. Dephosphorization and desulfurization method for molten iron alloy containing chromium. 4,450,004, Cl. 75-53.000.
Matsuoka, Kimiaki: *See*—
Kondow, Takeshi; Okazaki, Koshi; Katsuhara, Yutaka; and Matsuoka, Kimiaki, 4,450,298, Cl. 568-437.000.
Matsushita Electric Industrial Co.: *See*—
Okamura, Kouichi; Eriguchi, Yukio; Hagio, Katsushige; and Yamamoto, Setsuo, 4,449,662, Cl. 229-49.000.
Matsushita Electric Industrial Co., Ltd.: *See*—
Ishikawa, Kiyotsugu; Sone, Yoshiaki; Hashimoto, Susumu; Omae, Masanori; and Kunii, Takao, 4,450,475, Cl. 358-44.000.
Ito, Keisuke; Kashihara, Toshiaki; and Okino, Yoshihiro, 4,449,916, Cl. 425-174.400.
Kitao, Teijiro; Setsune, Jun-ichiro; Ishihara, Shoichi; and Yamamoto, Ryoichi, 4,449,516, Cl. 126-430.000.
Nakata, Koreaki; Ueno, Jiro; and Ogawa, Yasuhiro, 4,450,049, Cl. 204-35.00N.
Okamura, Yasushi; Manabe, Harukazu; and Sato, Norihide, 4,449,838, Cl. 400-234.000.
Saka, Hiroshi; and Tanaka, Toshihide, 4,450,584, Cl. 455-325.000.
Shimizu, Toshiki; and Inoue, Kazuyuki, 4,450,335, Cl. 219-10.55C.
Shinohara, Koichi, 4,450,186, Cl. 427-42.000.
Tanaka, Kazuyuki, 4,450,442, Cl. 340-814.000.
Yamada, Takahiro, 4,450,464, Cl. 357-30.000.
Matsushita Electronics Corporation: *See*—
Terakawa, Sumio; and Horii, Kenju, 4,450,484, Cl. 358-213.000.
Matsushita Reiki Co., Ltd.: *See*—
Kurahayashi, Takahisa, 4,449,895, Cl. 417-368.000.
Matsuura, Kazuo; Kuroda, Nobuyuki; Shiraishi, Takeichi; Shikatani, Yutaka; and Miyoshi, Mituji, to Nippon Oil Company, Limited. Carrier for olefin polymerization catalyst. 4,450,243, Cl. 502-131.000.
Mattel, Inc.: *See*—
Dunn, Ralph; and Coleman, Leonard R., 4,450,129, Cl. 264-132.000.
Mattes, Kenneth C.; and Warren, Harold C., to Eastman Kodak Company. Use of carbon adsorption deactivating compounds in image transfer elements. 4,450,222, Cl. 430-220.000.
Matteson, William R., to United States of America, Navy. Safe-arm training simulator. 4,449,939, Cl. 434-12.000.
Matthews, James B., to Raytheon Company. Laser gyro output optics structure. 4,449,824, Cl. 356-350.000.
Matushiro, Ryuichi: *See*—
Moriguchi, Koichi; Iwamoto, Kenzi; Matushiro, Ryuichi; Kawai, Hisasi; Mizuno, Nobutaka; and Ikuta, Yasuhiro, 4,449,367, Cl. 60-602.000.
Mauch, Fred E.: *See*—
Bubb, Charles E.; and Mauch, Fred E., 4,449,339, Cl. 52-195.000.
Maurath, Rudolf: *See*—
Strifler, Paul; Geissler, Heinrich; Ludtke, Dieter; Maurath, Rudolf; and Steinecke, Rudolf, 4,449,726, Cl. 280-81.00A.
Maxwell Laboratories, Inc.: *See*—
Asmus, John F., 4,450,568, Cl. 372-76.000.
May, Albert D., to University of Toronto Innovations Foundation, The. Optical measuring apparatus employing a laser. 4,449,825, Cl. 356-349.000.
Mayer, Endre A., to Bendix Corporation, The. Dual pressure metering for distributor pumps. 4,449,507, Cl. 123-467.000.
Mayer, James R., to Cooper Industries, Inc. Automatic drill string section changer. 4,449,592, Cl. 175-52.000.

Mayn, John W.: *See*—
McDonough, Kevin C.; Mayn, John W.; Swoboda, Gary L.; and Bellay, Jeffrey D., 4,450,521, Cl. 364-200.000.

Mays, Charles D.; Wagoner, Max A.; and Williard, Daniel G., to R. J. Reynolds Tobacco Company. Tobacco treatment process. 4,449,541, Cl. 131-302.000.

McAdams, Henry A.: *See*—
Mercer, James E., 4,449,879, Cl. 414-11.000.

McAfee, Richard C.; Adkins, James; and Miskowski, Richard L., to SWS Silicones Corporation. Platinum-styrene complexes which promote hydrosilation reactions. 4,450,283, Cl. 556-479.000.

McAllister, Dan R., to Westinghouse Electric Corp. Electromagnetic projectile launcher with magnetic spin stabilization. 4,449,441, Cl. 89-8.000.

MCC Corporation: *See*—
Nakamura, Masahiko; and Yokoyama, Takashi, 4,449,430, Cl. 81-98.000.

McCarthy, Cornelius J.; and Aplin, George E. Resurfacing process and tool for installing catridge-type. 4,449,330, Cl. 51-241.00S.

McClure, Donald R.: *See*—
Buckley, Michael E.; Tachira, Thomas N.; McClure, Donald R.; and Wieland, Michael S., 4,449,458, Cl. 102-430.000.

McComas, Jean, to Fairchild Industries, Inc. Multi role aircraft. 4,449,679, Cl. 244-118.200.

McConnell, Richard L.; Meyer, Max F., Jr.; and Petke, Frederick D., to Eastman Kodak Company. Polyester adhesives. 4,450,250, Cl. 524-141.000.

McCord, Robert C. Rearview mirror. 4,449,786, Cl. 350-293.000.

McCormack, Ray G.: *See*—
Nielsen, Paul H.; and McCormack, Ray G., 4,450,434, Cl. 340-506.000.

McCoy, Daniel E.: *See*—
Leon, Albert M.; and McCoy, Daniel E., 4,449,482, Cl. 122-4.00D.

McCoy, John T. Fire containment device and method. 4,449,589, Cl. 169-48.000.

McCracken, Elbert A.: *See*—
McSwain, Thad M.; and McCracken, Elbert A., 4,449,542, Cl. 135-98.000.

McCrory, William W.; Quigley, William B.; and Garnett, William A., to United States of America, Navy. Inflatable boat with demountable transom. 4,449,473, Cl. 114-354.000.

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Reed, Ronald G.; Schmuckal, Robin R.; and McCullough, Robert K., 4,450,387, Cl. 315-375.000.

McDonald Elevator: *See*—
Beath, Robert W.; and McDonald, John R., 4,449,615, Cl. 188-67.000.

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Beath, Robert W.; and McDonald, John R., 4,449,615, Cl. 188-67.000.

McDonough, Kevin C.; Mayn, John W.; Swoboda, Gary L.; and Bellay, Jeffrey D., to Texas Instruments Incorporated. Digital processor or microcomputer using peripheral control circuitry to provide multiple memory configurations and offset addressing capability. 4,450,521, Cl. 364-200.000.

McDougall, David A. Skiing apparatus. 4,449,735, Cl. 280-818.000.

McGlone, William R.: *See*—
Benedyk, Joseph C.; Amos, Homer C.; Scheie, Carl E.; and McGlone, William R., 4,449,712, Cl. 273-326.000.

McGraw-Edison Company: *See*—
Kristofek, Paul J., 4,450,512, Cl. 362-276.000.
Sadler, Fred S.; Hettwer, Paul F.; Viet, Vu H.; and Acker, Clarence R., 4,450,424, Cl. 336-94.000.

McGuire, John; and Bories, David G. Educational device for learning geographical names and locations. 4,449,941, Cl. 434-153.000.

McKay, Robert. Board game having means for ejection of playing pieces. 4,449,709, Cl. 273-248.000.

McKinney, Blake. Self-threading bolt. 4,449,874, Cl. 411-418.000.

McMillan, William P.; Hobbs, Charles C., Jr.; Gerberich, H. Robert; and Junker, Michael L., to Celanese Corporation. Process for converting methanol to formaldehyde. 4,450,301, Cl. 568-473.000.

McMullen, Warren H.; Cheasin, Hyman; and Siracusa, Denise, to M&T Chemicals Inc. Zinc and nickel tolerant trivalent chromium plating baths. 4,450,052, Cl. 204-51.000.

McPhee, Alexander H.: *See*—
Soot, Olaf; and McPhee, Alexander H., 4,450,134, Cl. 376-262.000.

McQueen, Malcolm M. Guide tube inserted liquid level sensor. 4,449,403, Cl. 73-295.000.

McSwain, Thad M.; and McCracken, Elbert A. Portable hunting blind. 4,449,542, Cl. 135-98.000.

Mead Corporation, The: *See*—
Betron, Frank A.; Davis, James W.; Kockler, Barry C.; and Spears, Lonnie K., 4,449,811, Cl. 355-3.0SH.

Mears, Gregory N., to General Electric Company. Voltage controlled oscillator. 4,450,416, Cl. 331-117.0FE.

Medicus, Gustav K.; and Medicus, Rudolf G. Small-sample dialyzer. 4,450,076, Cl. 210-242.100.

Medicus, Rudolf G.: *See*—
Medicus, Gustav K.; and Medicus, Rudolf G., 4,450,076, Cl. 210-242.100.

Meguro, Takeshi; and Ito, Yukio, to Fujitsu Limited. Dielectric filter. 4,450,421, Cl. 333-202.000.

Mehoudar, Raphael. Irrigation device. 4,449,669, Cl. 239-533.100.

Meier, John W., to Gulf & Western Industries, Inc. Turbine engine seal and method for repair thereof. 4,449,714, Cl. 277-9.000.

Meitzler, Allen H., to Ford Motor Company. Transmission medium for application in electrical and acoustical control systems. 4,450,376, Cl. 310-334.000.

Melcher, Roy L.: *See*—
Ruger, William B.; and Melcher, Roy L., 4,449,312, Cl. 42-66.000.

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Lisi, Edward L.; Melleby, Juul A.; and Andersson, Arne, 4,449,569, Cl. 165-1.000.

Melody, David P.; Grant, Seamus M.; and Martin, Francis R., to Loctite Corporation. Adhesive bonding method employing two-part composition with activator enriched with dihydropyridine ingredients. 4,450,030, Cl. 156-307.300.

Menge, Gunter: *See*—
Grieben, Karl H.; and Menge, Gunter, 4,449,625, Cl. 198-472.000.

Menges, John R.: *See*—
Cerwin, Robert J.; Joshi, Madhusudan; Menges, John R.; Mericle, Robert W.; and Zwaskis, William J., 4,449,531, Cl. 128-325.000.

Mennella, Robert J.; and Davidowitz, David. Flexible sleeve elbow for gas service lines. 4,449,853, Cl. 405-184.000.

Menor, George: *See*—
Jahsman, Hendrick; and Menor, George, 4,449,262, Cl. 5-63.000.

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Merck & Co., Inc.: *See*—
Hoffman, William F.; Smith, Robert L.; and Willard, Alvin K., 4,450,171, Cl. 424-279.000.

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Gehlhaus, Jurgen; and Herz, Claus P., 4,450,276, Cl. 548-303.000.

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Cerwin, Robert J.; Joshi, Madhusudan; Menges, John R.; Mericle, Robert W.; and Zwaskis, William J., 4,449,531, Cl. 128-325.000.

Meritus Industries, Inc.: *See*—
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Merten, Josef: *See*—
Idel, Karsten; Freitag, Dieter; and Merten, Josef, 4,450,266, Cl. 524-265.000.

Merz, Charles J., III: *See*—
Reisman, Arnold; Berkenblit, Melvin; and Merz, Charles J., III, 4,449,580, Cl. 165-104.340.

Merz, Walter; and Friedli, Hans, to Swiss Aluminium Ltd. Device for feeding electrolytic cells and method of operating the said device. 4,450,053, Cl. 204-67.000.

Messer, Dieter; Wilhelm, Volker; Endres, Robert; and Heine, Heinrich, to Bayer Aktiengesellschaft. Flocculation-resistant, mixed phase pigments having a rutile structure, process for their preparation, and their use. 4,450,012, Cl. 106-300.000.

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Liebhardt, Josef; Fuhrer, Rudolf; and Dautel, Erich, 4,449,454, Cl. 102-226.000.

Messerschmitt-Bolkow-Blohm GmbH: *See*—
Hahnel, Thomas, 4,449,361, Cl. 60-254.000.

Messingschlager, Walter. Body fluid drainage tube. 4,449,974, Cl. 604-175.000.

METCO Incorporated: *See*—
Longo, Frank N.; Bader, Nicholas F., III; and Dorfman, Mitchell R., 4,450,184, Cl. 427-34.000.

Meuleman, Lambertus J.; van de Grijp, Abram; and Roza, Engel, to U.S. Philips Corporation. Apparatus for modulating the output signal of a converter. 4,450,564, Cl. 372-26.000.

Meurer Non Food Product GmbH: *See*—
Vossen, Franz, 4,449,744, Cl. 294-87.200.

Meyer, John R., r., to United States of America, Navy. Detachable storage tank for hydrofoils. 4,449,472, Cl. 114-274.000.

Meyer, Max F., Jr.: *See*—
McConnell, Richard L.; Meyer, Max F., Jr.; and Petke, Frederick D., 4,450,250, Cl. 524-141.000.

Micha, Peter, to Pem Fountain Co. Submersible high intensity lamp. 4,450,511, Cl. 362-267.000.

Michaels, Alan S., to Alza Corporation. Microporous film with polymer in pores for regulating passage of fluid. 4,450,198, Cl. 428-315.500.

Michel, Thomas J.: *See*—
Corbitt, John; and Michel, Thomas J., 4,449,538, Cl. 128-760.000.

Microdot Inc.: *See*—
Berecz, Imre; Schultz, Dennis; and Daniel, Leroy O., 4,449,283, Cl. 29-566.100.

Middleman, Lee M.: *See*—
Doljack, Frank A.; and Middleman, Lee M., 4,450,496, Cl. 361-58.000.

Mifune, Takao: *See*—
Itoh, Fumikazu; Fujita, Yasuhiro; Kobayashi, Takashi; and Mifune, Takao, 4,449,293, Cl. 29-736.000.

Mignotte, Claude: *See*—
Disclaire, Jacques; and Mignotte, Claude, 4,449,288, Cl. 29-596.000.

Miki, Yukio; and Egawa, Takeshi, to Minolta Camera Kabushiki Kaisha. Automatic system and interchangeable optical instrument therefor. 4,449,807, Cl. 354-195.100.

Millar, Thomas D.; and Miller, David M., to AHI Operations Limited. Methods of making intra-vaginal devices and/or intra-vaginal devices. 4,449,980, Cl. 604-890.000.

Miller, David M.: *See*—
Millar, Thomas D.; and Miller, David M., 4,449,980, Cl. 604-890.000.

Miller Electric Manufacturing Company: *See*—
Corrigall, Don J.; and Schiedermayer, Marvin L., 4,450,340, Cl. 219-132.000.
Miller, Wendell E.: *See*—
Ellingson, Gary L.; and Miller, Wendell E., 4,450,450, Cl. 343-758.000.
Miller, William H.; and Frank, Joseph J., to General Electric Company. Apparatus for vibration reduction in dynamoelectric machines. 4,450,373, Cl. 310-51.000.
Millerburg, John W. Method and projecting typositor for composing typographical artwork on color sensitive photographic medium. 4,449,801, Cl. 354-12.000.
Milliken Research Corporation: *See*—
Engels, Walter, 4,449,276, Cl. 26-2.00R.
Moore, James R.; and Warner, Charles E., 4,449,354, Cl. 57-284.000.
Moore, James R.; Schroder, William J.; Warner, Charles E.; and Pittman, Edgar H., 4,449,355, Cl. 57-284.000.
Warner, Charles E., 4,449,356, Cl. 57-284.000.
Millmaster Onyx Group, Inc.: *See*—
Green, Harold A.; Petrocci, Alfonso N.; and Dudzinski, Zdzislaw W., 4,450,174, Cl. 424-329.000.
Millward, Barry: *See*—
Berger, Kerry R.; Kaspersma, Jelle H.; Luybli, Joseph R.; Millward, Barry; and Shay, Robert H., 4,450,017, Cl. 148-16.000.
Mimura, Akio; Yuasa, Katsumi; and Shibukawa, Mitsuru, to Asahi Kasei Kogyo Kabushiki Kaisha. Immobilization of microorganisms in a polymer gel. 4,450,233, Cl. 435-178.000.
Mink, Robert I., to Stauffer Chemical Company. Catalyst for polymerizing olefins. 4,450,242, Cl. 502-105.000.
Minnesota Mining and Manufacturing Company: *See*—
Baribeau, Gary A., 4,449,777, Cl. 339-103.00R.
Delfino, Gerolamo; and Franco, Simone, 4,450,230, Cl. 430-539.000.
Gould, Jay W., III, 4,449,982, Cl. 604-891.000.
Holmes, Brian N.; Dalzell, Rex J.; and Aasen, Steven M., 4,450,227, Cl. 430-339.000.
Reece, Jack E., 4,450,229, Cl. 430-523.000.
West, Arthur C., 4,450,263, Cl. 526-249.000.
Minnis, Ralph L.: *See*—
Ragas, Frank J.; Minnis, Ralph L.; and Beauchamp, Gerson E., 4,450,203, Cl. 428-514.000.
Minolta Camera Kabushiki Kaisha: *See*—
Miki, Yukio; and Egawa, Takeshi, 4,449,807, Cl. 354-195.100.
Nakamura, Akiyoshi; and Tokumaru, Hisashi, 4,449,793, Cl. 350-458.000.
Yuasa, Yoshio; and Naruse, Kazuhiko, 4,449,822, Cl. 356-227.000.
Miskowski, Richard L.: *See*—
McAfee, Richard C.; Adkins, James; and Miskowski, Richard L., 4,450,283, Cl. 556-479.000.
Mithuhira, Kuniaki; Kamata, Keiji; and Suzuki, Hikoshiro, to Topre Corporation. Air quantity regulating apparatus for air conditioning. 4,449,664, Cl. 236-49.000.
Mitsubishi Denki Kabushiki Kaisha: *See*—
Arimoto, Satomi; Yamaji, Shigeru; and Ishitobi, Chikato, 4,450,329, Cl. 200-148.00A.
Morishita, Akira, 4,450,423, Cl. 335-131.000.
Naruki, Toshimasa, 4,450,495, Cl. 360-137.000.
Nishizako, Shizutaka; and Tazawa, Hiroaki, 4,450,328, Cl. 200-144.00R.
Yamamoto, Takeski, 4,450,469, Cl. 357-56.000.
Yoshino, Masataka; Hashimoto, Yoshiki; and Ushikosi, Yasunori, 4,449,574, Cl. 165-11.00R.
Mitsubishi Jukogyo Kabushiki Kaisha: *See*—
Hasegawa, Akira; and Sakaguchi, Katsuyoshi, 4,449,903, Cl. 425-38.000.
Hasegawa, Akira; and Miyamoto, Yoshinori, 4,449,917, Cl. 425-149.000.
Mitsubishi Kinzoku Kabushiki Kaisha: *See*—
Itaba, Takeshi; Matsumoto, Shotaro; and Abe, Takeshi, 4,450,205, Cl. 428-552.000.
Mitsuboshi Belting Ltd.: *See*—
Matsumura, Kaname, 4,449,959, Cl. 474-238.000.
Mittal, Faquir C.; and Mathias, Joseph S., to Sperry Corporation. Apparatus for cooling integrated circuit chips. 4,450,505, Cl. 361-386.000.
Miyachi, Takeshi; Tsuda, Hisanori; Hara, Toshitami; and Kasugayama, Yukio, to Canon Kabushiki Kaisha. Liquid-jet recording head. 4,450,457, Cl. 346-140.00R.
Miyamoto, Haruhiko; and Yonezawa, Masatomo, to Nippon Electric Co., Ltd. Ceramic compositions having high dielectric constant and high specific resistivity. 4,450,240, Cl. 301-136.000.
Miyamoto, Takehiko, to Kabushiki Kaisha Sato. Cutting device for tag web. 4,449,433, Cl. 83-76.000.
Miyamoto, Yoshinori: *See*—
Hasegawa, Akira; and Miyamoto, Yoshinori, 4,449,917, Cl. 425-149.000.
Miyata, Yukinori: *See*—
Furuhashi, Yasuhiro; Miyata, Yukinori; and Hishinuma, Osamu, 4,449,504, Cl. 123-447.000.
Miyazaki, Yoshiro; Yasunaga, Toshio; and Sasaki, Tomiya, to Tokyo Shibaura Denki Kabushiki Kaisha. Cooling apparatus for a closed housing. 4,449,579, Cl. 165-104.330.
Miyoshi, Mituji: *See*—
Matsuura, Kazuo; Kuroda, Nobuyuki; Shiraishi, Takeichi; Shikatani, Yutaka; and Miyoshi, Mituji, 4,450,243, Cl. 502-131.000.
Miyoshi, Tadahiko; Yamazaki, Takeo; Maeda, Kunihiro; Takahashi, Ken; and Oowada, Siniti, to Hitachi, Ltd. Nonlinear resistor and process for producing the same. 4,450,426, Cl. 338-21.000.
Mizukami, Mineo, to Nippon Electric Co., Ltd. PAL System synchronizing signal generating apparatus. 4,450,474, Cl. 358-19.000.
Mizuno Corporation: *See*—
Hayashi, Keijiro; Awano, Toshimi; Yoshikawa, Masayuki; Yazawa, Kouzou; and Ito, Takashi, 4,449,707, Cl. 273-171.000.
Mizuno, Nobutaka: *See*—
Moriguchi, Koichi; Iwamoto, Kenzi; Matushiro, Ryuichi; Kawai, Hisasi; Mizuno, Nobutaka; and Ikuta, Yasuhiro, 4,449,367, Cl. 60-602.000.
Sone, Shigeru; Ikuta, Yasuhiro; Komiya, Kazuaki; Kihira, Kazuhide; and Mizuno, Nobutaka, 4,449,371, Cl. 60-611.000.
Mobil Oil Corporation: *See*—
Abdo, Milton K., 4,450,084, Cl. 252-8.55D.
Angevine, Philip J.; Carroll, Michael B.; Shih, Stuart S.; and Tabak, Samuel A., 4,450,067, Cl. 208-86.000.
Forbus, Nancy P.; and Wu, Margaret M., 4,449,961, Cl. 585-640.000.
Hegedus, Allan J., 4,449,394, Cl. 73-55.000.
Horodysky, Andrew G., 4,450,096, Cl. 252-32.70E.
Neeley, Walter P., 4,450,543, Cl. 367-154.000.
Wright, Bernard S.; Owen, Hartley; and Hsia, Chung H., 4,450,311, Cl. 585-413.000.
Modern Arts Packaging, Inc.: *See*—
Lindsay, Alexander, 4,450,580, Cl. 383-6.000.
Mogg, Alan A.: *See*—
Horn, Spencer C.; and Mogg, Alan A., 4,449,849, Cl. 405-52.000.
Mohaupt, Hubert: *See*—
Hones, Helmut; and Mohaupt, Hubert, 4,449,598, Cl. 180-6.500.
Mokuya, Hiroichi; Yokko, Masao; Komatsu, Hiroyuki; Suzuki, Katsuhisa; and Kitayama, Takeo, to Suzuki Motor Company Limited. Cylinder-number-controlled engine. 4,449,496, Cl. 123-198.00F.
Mole-Richardson Company: *See*—
Krokaugger, William G., 4,450,384, Cl. 315-127.000.
Monarch Marking Systems, Inc.: *See*—
Hamisch, Paul H., Jr.; and Makley, James A., 4,450,035, Cl. 156-384.000.
Monsanto Company: *See*—
Chi, Ching T.; and Lester, J. Harvey, Jr., 4,450,291, Cl. 562-530.000.
Montgomery, John A.: *See*—
Temple, Carroll G., Jr.; Montgomery, John A.; Elliott, Robert D.; and Wheeler, Glynn P., 4,450,160, Cl. 424-250.000.
Montgomery, John R., IV; and Richardson, Donald R. Break away alarm clock. 4,449,833, Cl. 368-262.000.
Moore, James R.; and Warner, Charles E., to Milliken Research Corporation. Disc type yarn tension control. 4,449,354, Cl. 57-284.000.
Moore, James R.; Schroder, William J.; Warner, Charles E.; and Pittman, Edgar H., to Milliken Research Corporation. A.C.-D.C. Slotted type yarn tension control. 4,449,355, Cl. 57-284.000.
Moorhead, Albert B. Snake trap. 4,449,316, Cl. 43-10.000.
Moran, Frank. Auto luggage carrier. 4,449,657, Cl. 224-329.000.
Moran, J. Thomas: *See*—
Demuth, Gordon L.; Hinkle, John E.; and Moran, J. Thomas, 4,450,525, Cl. 364-200.000.
Morawietz, Hans-Joachim; Hoffman, Erich; Hanauer, Johann; and Bauer, Kurt, to Hoechst Aktiengesellschaft. 3-Oxypropyleneiminobis-(methylene phosphonic acids) and their salts, process for their manufacture and their use. 4,450,116, Cl. 260-502.50E.
Moretti, Vincent: *See*—
Sawka, Steven; Moretti, Vincent; and Heal, Sam F., 4,450,382, Cl. 315-082.000.
Morgan, Barry A., to Sterling Drug Inc. Analgesic dipeptide amides and method of use and compositions thereof. 4,450,155, Cl. 424-177.000.
Morgan, Martin B.; Morgan, Marvin C.; and Linde, John W. Insulating dashboard cover having antiglare and heat resistant characteristics. 4,449,747, Cl. 296-97.00E.
Morgan, Marvin C.: *See*—
Morgan, Martin B.; Morgan, Marvin C.; and Linde, John W., 4,449,747, Cl. 296-97.00E.
Mori, Mamoru: *See*—
Yasumatsu, Jun; Mori, Mamoru; Nishiwaki, Toshihito; and Owada, Akira, 4,449,752, Cl. 297-341.000.
Moriguchi, Koichi; Iwamoto, Kenzi; Matushiro, Ryuichi; Kawai, Hisasi; Mizuno, Nobutaka; and Ikuta, Yasuhiro, to Nippon Soken, Inc.; and Toyota Jidosha Kabushiki Kaisha. Knocking control device for turbocharged internal combustion engine. 4,449,367, Cl. 60-602.000.
Morimoto, Takeshi, to Kyoto University. Magnetic-infrared-emitting diode. 4,450,460, Cl. 357-17.000.
Morimoto, Yoshiro: *See*—
Suga, Masaaki; Morimoto, Yoshiro; and Hamada, Hideo, 4,449,618, Cl. 192-3.310.
Morino, Toshiharu: *See*—
Nakamura, Norihiko; Ito, Takaaki; Katou, Takashi; Ota, Yozo; and Morino, Toshiharu, 4,450,117, Cl. 261-39.00A.
Morishita, Akira, to Mitsubishi Denki Kabushiki Kaisha. Magnetic switch. 4,450,423, Cl. 335-131.000.

Morita, Masanobu: *See*—
Tani, Tatsuo; Sawata, Sinji; Tanaka, Tadayoshi; Sakuta, Koichi; Nakamoto, Yasunobu; Sekiya, Hideshi; Morita, Masanobu; and Yamagata, Norio, 4,449,517, Cl. 126-435.000.

Moriyama, Masaru, to Victor Company of Japan, Limited. D/A Converting circuit having two D/A converters for decoding and converting a digital signal into an analog signal. 4,450,433, Cl. 340-347.0DA.

Morlock, Ruben D.; Kopecky, Ivyl D.; Anderson, Robert R.; and Marcy, Dewey R., to Haybuster Manufacturing, Inc. Machine for loading and disintegrating large bales of forage material. 4,449,672, Cl. 241-101.700.

Morrow, James G., Sr.: *See*—
Helm, Percy R.; and Morrow, James G., Sr., 4,449,635, Cl. 212-196.000.

Moss, Philip H.; and Nieh, Edward C. Y., to Texaco Inc. Hydroxy-containing bicycloalkane ether compounds. 4,450,307, Cl. 568-665.000.

Motoda Denshi Kogyo Kabushiki Kaisha: *See*—
Motoda, Kenro, 4,449,884, Cl. 414-749.000.

Motoda, Kenro, to Motoda Denshi Kogyo Kabushiki Kaisha. Universal robot. 4,449,884, Cl. 414-749.000.

Motor Wheel Corporation: *See*—
Weeks, James B., 4,449,756, Cl. 301-37.00P.

Motorola Inc.: *See*—
Cho, Frederick Y.; and Hickernell, Fred S., 4,450,374, Cl. 310-313.00B.
Conner, Leo B., Jr.; and Nelson, Robert N., 4,450,445, Cl. 343-7.500.
Noble, Scott W., 4,450,573, Cl. 375-104.000.
Strobel, Russell A.; Rihani, Jawdat; and Lunquist, Richard E., 4,450,583, Cl. 455-86.000.
Whatley, Roger A., 4,450,367, Cl. 307-297.000.

Mount, Houston B., II: *See*—
Jageler, Alfred H.; Bruce, Gary D.; and Mount, Houston B., II, 4,449,593, Cl. 175-58.000.

MPL, Inc.: *See*—
Finkelstein, Sam D., 4,449,640, Cl. 220-270.000.

MTD Products Inc.: *See*—
Hauser, Hans, 4,449,424, Cl. 74-701.000.

MTU Motoren-und Turbinen Union Munchen GmbH: *See*—
Huther, Werner, 4,450,314, Cl. 136-230.000.

Mueller, Robert J., to General Electric Company. X-Ray tomography table having a virtual fulcrum arm pivot. 4,450,575, Cl. 378-26.000.

Mulhauser, Paul J.: *See*—
Burbo, James H.; Hartman, Louis P.; Spranger, Douglas M.; Brookes, Malcolm J.; and Mulhauser, Paul J., 4,449,787, Cl. 350-538.000.

Muller, Heinz K., to Busak & Luyken. Packing for hydraulic pistons or piston rods. 4,449,718, Cl. 277-170.000.

Mulrooney, James F. Combination scraping plane. 4,449,299, Cl. 30-169.000.

Mumford, Eustace H.: *See*—
Irwin, George W.; and Mumford, Eustace H., 4,449,996, Cl. 65-305.000.

Mundhenke, Ivan W. Horizontal axis windmill. 4,449,887, Cl. 415-4.000.

Munekawa, Masaaki, to Showa Aluminum Corporation. Device for releasing heat. 4,449,578, Cl. 165-104.330.

Municipal Industries, Inc.: *See*—
Dittmann, Fred M., Jr., 4,449,602, Cl. 180-215.000.

Munter, Ernst A., to Northern Telecom Limited. Switching network for use in a time division multiplex system. 4,450,557, Cl. 370-58.000.

Murakami, Shu: *See*—
Arimura, Katsuo; Murakami, Shu; and Oka, Taichi, 4,450,275, Cl. 548-201.000.

Murata Manufacturing Co., Ltd.: *See*—
Murata, Michihiro, 4,450,429, Cl. 338-35.000.

Murata, Michihiro, to Murata Manufacturing Co., Ltd. Humidity sensitive resistance device. 4,450,429, Cl. 338-35.000.

Murata, Mineo: *See*—
Tokoro, Takehiko; Kashima, Shoichi; and Murata, Mineo, 4,449,856, Cl. 405-269.000.

Murphy, Randall T.; and Heling, Dennis H., to Lear Siegler, Inc. Seat backrest having an adjustable lumbar support. 4,449,751, Cl. 297-284.000.

Murray, Daniel J.: *See*—
Woo, Edmund P.; and Murray, Daniel J., 4,450,285, Cl. 560-206.000.

Murray, Edward R.; van der Laan, Jan E.; Rosengreen, Arne; and Byer, Robert L., to SRI International. Frequency-mixed CO_2 laser radar for remote detection of gases in the atmosphere. 4,450,356, Cl. 250-339.000.

Musser, Lester W., Jr.; and Germain, Lee A., to Goodyear Aerospace Corporation. Non-reversible brake adjuster. 4,449,616, Cl. 188-71.800.

Muszynski, Larry C., to Shell Oil Company. Buckle arrestor. 4,449,852, Cl. 405-168.000.

Mutsubishi Rubber Co., Ltd.: *See*—
Kitawaki, Michio; and Annaka, Masao, 4,449,717, Cl. 277-153.000.

Mycro-Group Company: *See*—
Gordin, Myron K., 4,450,507, Cl. 362-61.000.

Myers Electric Products Inc.: *See*—
Warner, Michael J., 4,450,503, Cl. 361-356.000.

Myrens Verkated A/S: *See*—
Fritzvold, Bjorn H.; and Soteland, Nicolai, 4,450,044, Cl. 162-65.000.

Nabisco Brands, Inc.: *See*—
Vink, Walter V.; and Aldrich, Deborah G., 4,450,179, Cl. 426-103.000.

Naganawa, Yutaka: *See*—
Suga, Katsuyuki; Kitada, Toyofumi; Naganawa, Yutaka; and Nakagawa, Hirotaka, 4,450,018, Cl. 148-26.000.

Nagano, Takahiro; Sanpei, Isamu; Sakurada, Shuroku; and Nakagawa, Masaru, to Hitachi, Ltd. Gate turn-off thyristor with selective anode penetrating shorts. 4,450,467, Cl. 357-38.000.

Nagasawa, Takeshi; Kuroiwa, Katsumasa; and Takabayashi, Katsuyuki, to Nitto Boseki Co., Ltd. Substrates for measuring thrombin. 4,450,105, Cl. 260-112.50R.

Nagoshi, Fumiya: *See*—
Matsumoto, Sigemi; and Nagoshi, Fumiya, 4,450,256, Cl. 525-316.000.

Nakagawa, Hirotaka: *See*—
Suga, Katsuyuki; Kitada, Toyofumi; Naganawa, Yutaka; and Nakagawa, Hirotaka, 4,450,018, Cl. 148-26.000.

Nakagawa, Hiroyuki: *See*—
Fujita, Taira; Nakagawa, Hiroyuki; Sugihara, Mikio; Kobayashi, Kimiyuki; and Okamoto, Katuhiko, 4,450,114, Cl. 260-458.00C.

Nakagawa, Masaru: *See*—
Nagano, Takahiro; Sanpei, Isamu; Sakurada, Shuroku; and Nakagawa, Masaru, 4,450,467, Cl. 357-38.000.

Nakagawa, Toshiharu: *See*—
Ando, Hideo; Nakagawa, Toshiharu; and Fujimori, Yoshinori, 4,450,452, Cl. 346-135.100.

Nakamoto, Soichi: *See*—
Sakurada, Nobuaki; Kawamura, Masaharu; Ohtaki, Shohei; Nakamoto, Soichi; and Shinoda, Nobuhiko, 4,449,805, Cl. 354-105.000.

Nakamoto, Yasunobu: *See*—
Tani, Tatsuo; Sawata, Sinji; Tanaka, Tadayoshi; Sakuta, Koichi; Nakamoto, Yasunobu; Sekiya, Hideshi; Morita, Masanobu; and Yamagata, Norio, 4,449,517, Cl. 126-435.000.

Nakamura, Akihiko: *See*—
Saito, Hisatoshi; Fujii, Shuzo; Takase, Itaru; Nakamura, Akihiko; and Hara, Yoshihiro, 4,449,861, Cl. 406-39.000.

Nakamura, Akiyoshi; and Tokumaru, Hisashi, to Minolta Camera Kabushiki Kaisha. Inverted telephoto type wide angle lens system. 4,449,793, Cl. 350-458.000.

Nakamura, Hisashi: *See*—
Kawatei, Hisatsugu; Saito, Hidetoshi; and Nakamura, Hisashi, 4,449,500, Cl. 123-380.000.

Nakamura, Ken: *See*—
Haneda, Satoshi; Itoh, Takashi; Nakamura, Ken; and Tomono, Makoto, 4,450,220, Cl. 430-102.000.

Nakamura, Masahiko; and Yokoyama, Takashi, to MCC Corporation. Pipe gripping tools. 4,449,430, Cl. 81-98.000.

Nakamura, Norihiko; Ito, Takaaki; Katou, Takashi; Ota, Yozo; and Morino, Toshiharu, to Toyota Jidosha Kabushiki Kaisha; and Aisan Industry Co., Ltd. Variable venturi-type carburetor. 4,450,117, Cl. 261-39.00A.

Nakamura, Shigeru; Maeda, Takeshi; Kaku, Toshimitsu; Tsunoda, Yoshito; Takasugi, Wasao; and Kaneda, Tokuya, to Hitachi, Ltd. Focal position detecting optical apparatus. 4,450,547, Cl. 369-45.000.

Nakamura, Tatuo: *See*—
Iwato, Susumu; Nakamura, Tatuo; and Kurauchi, Takeo, 4,450,200, Cl. 428-323.000.

Nakamura, Zenzo, to Canon Kabushiki Kaisha. Adapter device. 4,449,802, Cl. 354-416.000.

Nakano, Junji: *See*—
Horie, Seiji; Nakano, Junji; and Sato, Hideo, 4,450,219, Cl. 430-59.000.

Nakano, Masao: *See*—
Takemae, Yoshihiro; Nakano, Tomio; Nakano, Masao; Tsuge, Norihisa; and Ohira, Tsuyoshi, 4,450,515, Cl. 363-60.000.

Nakano, Takashi: *See*—
Kitamura, Takashi; Watanabe, Asao; Nakano, Takashi; Masaki, Katsumi; Hirayama, Kazuhiro; Sato, Yasushi; and Tokiwa, Taisuke, 4,450,453, Cl. 346-108.000.

Nakano, Tomio: *See*—
Takemae, Yoshihiro; Nakano, Tomio; Nakano, Masao; Tsuge, Norihisa; and Ohira, Tsuyoshi, 4,450,515, Cl. 363-60.000.

Nakao, Yasuyuki; Hoshijima, Yosuke; and Okohira, Kazuo, to Nippon Steel Corporation. Metal refining method. 4,450,005, Cl. 75-60.000.

Nakashima, Masato; Koezuka, Tetsuo; and Inagaki, Takefumi, to Fujitsu Limited. Recognition method and apparatus. 4,450,579, Cl. 382-8.000.

Nakashima, Toshiaki: *See*—
Eto, Hiromichi; Kohmoto, Teruo; Kouda, Tadayuki; Ogawa, Youichiro; Sato, Susumu; Kuraishi, Tadayuki; and Nakashima, Toshiaki, 4,450,109, Cl. 260-243.300.

Nakata, Koreaki; Ueno, Jiro; and Ogawa, Yasuhiro, to Matsushita Electric Industrial Co., Ltd. Method of forming tantalum capacitor anodes and making the capacitors. 4,450,049, Cl. 204-35.00N.

Nakatani, Hiroshi; and Yamamoto, Hachizou, to Sharp Kabushiki Kaisha. Money preset in an electronic cash register. 4,450,526, Cl. 364-405.000.

Nakatani, Nobuji; Inatani, Reiko; and Konishi, Tadashi, to Lion Corporation. Antioxidative compound, method of extracting same from rosemary, and use of same. 4,450,097, Cl. 252-404.000.

Nakayama, Isao: *See*—
Kamioka, Toshiharu; Nakayama, Isao; Honda, Takeo; Kobayashi, Takashi; Obata, Tokio; Fujii, Katsutoshi; Kojima, Mikio; and Akiyoshi, Yuji, 4,450,162, Cl. 424-251.000.

Nakayama, Yutaka: *See*—
Yamada, Tetsusyo; and Nakayama, Yutaka, 4,450,065, Cl. 204-412.000.
Nalco Chemical Company: *See*—
Huang, Shu-Jen W., 4,450,092, Cl. 252-181.000.
Narasimham, Mandayam C., to Allied Corporation. Continuous casting controller. 4,449,568, Cl. 164-453.000.
Naruki, Toshimasa, to Mitsubishi Denki Kabushiki Kaisha. Portable acoustic device. 4,450,495, Cl. 360-137.000.
Naruse, Kazuhiko: *See*—
Yuasa, Yoshio; and Naruse, Kazuhiko, 4,449,822, Cl. 356-[illegible].000.
National Bulk Equipment, Inc.: *See*—
Hartman, John E., 4,449,880, Cl. 414-421.000.
National Distillers and Chemical Corporation: *See*—
Feldman, Julian, 4,450,294, Cl. 562-608.000.
National Starch and Chemical Corporation: *See*—
Chiao, Wen B.; and Ray-Chaudhuri, Dilip K., 4,450,261, Cl. 526-214.000.
Nava, Pier L. Device to secure belts and similar parts to resin structures, helmets in particular. 4,449,275, Cl. 24-458.000.
Nave, Jerald L.: *See*—
White, Daniel S.; and Nave, Jerald L., 4,449,525, Cl. 128-203.110.
Nayler, Douglas W. J., to NL Industries, Inc. Motion compensator system. 4,449,854, Cl. 405-195.000.
NCR Corporation: *See*—
Hain, David A., 4,449,399, Cl. 73-159.000.
Hardy, James A., 4,450,350, Cl. 235-467.000.
Necchi Societa per Azioni: *See*—
Bar, Alfredo, 4,449,610, Cl. 181-243.000.
Neeley, Walter P., to Mobil Oil Corporation. Sectionalized marine seismic cable. 4,450,543, Cl. 367-154.000.
Neidinger, Karen A.: *See*—
Larson, Robert W.; Lou, Wen C.; DeVito, Vivian C.; and Neidinger, Karen A., 4,450,177, Cl. 426-19.000.
Nelson, Philip H.: *See*—
Quigley, William D.; and Nelson, Philip H., 4,450,321, Cl. 179-1.50M.
Nelson, Robert N.: *See*—
Conner, Leo B., Jr.; and Nelson, Robert N., 4,450,445, Cl. 343-7.500.
Nelson, Rodney L. Thin seam mining machine. 4,449,755, Cl. 299-31.000.
Nemes, Jozsef: *See*—
Soos, Rudolf; Nemes, Jozsef; Vidra, Laszlo; Szelestei, Miklos; Kovacs, Gabor; and Szekeley, Istvan, 4,450,309, Cl. 570-217.000.
New York University: *See*—
Llinas, Rodolfo R.; and Pellionisz, Andras J., 4,450,530, Cl. 364-513.000.
Newsome, Peter M.: *See*—
Beeley, Lee J.; and Newsome, Peter M., 4,450,170, Cl. 424-273.00R.
Nezot, Francois; Girault, Pierre; Tessier, Jean; and Martel, Jacques, to Roussel Uclaf. Insecticidal esters. 4,450,169, Cl. 424-270.000.
NGK Spark Plug Co., Ltd.: *See*—
Yamada, Tetsusyo; and Nakayama, Yutaka, 4,450,065, Cl. 204-412.000.
Nibco, Inc.: *See*—
Hobart, Ralph J.; Rupp, Robert D.; and Mastro, Paul F., 4,449,694, Cl. 251-171.000.
Nickisch, Klaus; Laurent, Henry; Wiechert, Rudolf; and Casals-Stenzel, Jorge, to Schering Aktiengesellschaft. 7α-Alkoxycarbonyl-15β,16β-methylene-4-androstenes, process for the preparation thereof, and use thereof as medicinal agents. 4,450,107, Cl. 424-238.000.
Nicolon Corporation: *See*—
Scales, John M.; and Wolcott, Bernard F., 4,449,847, Cl. 405-19.000.
Nieh, Edward C. Y.: *See*—
Moss, Philip H.; and Nieh, Edward C. Y., 4,450,307, Cl. 568-665.000.
Nielsen, Elgard, to V. Kann Rasmussen Holding A/S. Tilting window, especially for installation in an inclined roof. 4,449,327, Cl. 49-390.000.
Nielsen, Paul H.; and McCormack, Ray G., to United States of America, Army. Apparatus for determining break locations in fencing. 4,450,434, Cl. 340-506.000.
Nihon Sogo-Bosui Co., Ltd.: *See*—
Tokoro, Takehiko; Kashima, Shoichi; and Murata, Mineo, 4,449,856, Cl. 405-269.000.
Nihon Soil Engineering Co., Ltd.: *See*—
Tokoro, Takehiko; Kashima, Shoichi; and Murata, Mineo, 4,449,856, Cl. 405-269.000.
Nikomarov, Samuil S.; Kochnev, Anatoly M.; Goldobin, Vladimir B.; Sarapulov, Jury M.; and Valdman, Isaak Y., to Permsky Filial Vsesojuznogo Nauchno-Issledovatelskogo Instituta Burovoi Tekhniki. Articulated coupling. 4,449,953, Cl. 464-19.000.
Nill, Eberhard, to International Standard Electric Corporation. Method of adjusting the electrode spacings in systems of electron-beam tubes. 4,449,951, Cl. 445-34.000.
Nilssen, Ole K. Incandescent-fluorescent compatible lighting products. 4,450,510, Cl. 362-221.000.
Nilsson, Jack E., Sr., to Seige Corporation. Apparatus for collecting, intensifying and storing solar energy. 4,449,515, Cl. 126-430.000.
Nippon Atsudenki Kabushiki Kaisha: *See*—
Fujino, Shoji, 4,450,586, Cl. 455-161.000.
Nippon Cable System Inc.: *See*—
Baba, Masanao, 4,449,420, Cl. 74-501.00R.
Nippon Electric Co., Ltd.: *See*—
Miyamoto, Haruhiko; and Yonezawa, Masatomo, 4,450,240, Cl. 501-136.000.
Mizukami, Mineo, 4,450,474, Cl. 358-19.000.
Shiba, Hiroshi, 4,450,470, Cl. 357-59.000.
Nippon Gakki Seizo Kabushiki Kaisha: *See*—
Takamura, Masayuki; and Kurahashi, Kazuo, 4,450,210, Cl. 428-660.000.
Nippon, Kayaku, Kabushiki, Kaisha: *See*—
Shirosaki, Tsutomu; and Fukunaga, Seiki, 4,450,279, Cl. 549-27.000.
Nippon Kogaku K.K.: *See*—
Hasegawa, Hiroshi, 4,450,506, Cl. 362-4.000.
Nohda, Masao, 4,449,798, Cl. 351-207.000.
Terasawa, Hidenori; and Hayashi, Kiyoshi, 4,449,791, Cl. 350-427.000.
Yamada, Kenji, 4,449,794, Cl. 350-472.000.
Nippon Kokan Kabushiki Kaisha: *See*—
Akita, Shinji; Hatanaka, Masayuki; and Uemura, Akira, 4,449,386, Cl. 72-100.000.
Hara, Tomihiro; Ogawa, Masahiro; and Yamashita, Masaaki, 4,450,209, Cl. 428-626.000.
Suga, Katsuyuki; Kitada, Toyofumi; Naganawa, Yutaka; and Nakagawa, Hirotaka, 4,450,018, Cl. 148-26.000.
Nippon Oil Company, Limited: *See*—
Matsuura, Kazuo; Kuroda, Nobuyuki; Shiraishi, Takeichi; Shikatani, Yutaka; and Miyoshi, Mituji, 4,450,243, Cl. 502-131.000.
Nippon Paint Co., Ltd.: *See*—
Iwato, Susumu; Nakamura, Tatuo; and Kurauchi, Takeo, 4,450,200, Cl. 428-323.000.
Nippon Soken, Inc.: *See*—
Moriguchi, Koichi; Iwamoto, Kenzi; Matushiro, Ryuichi; Kawai, Hisasi; Mizuno, Nobutaka; and Ikuta, Yasuhiro, 4,449,367, Cl. 60-602.000.
Ohta, Minoru; Hattori, Yutaka; Kawakami, Tomio; and Onoda, Michitosi, 4,450,428, Cl. 338-34.000.
Nippon Steel Corporation: *See*—
Nakao, Yasuyuki; Hoshijima, Yosuke; and Okohira, Kazuo, 4,450,005, Cl. 75-60.000.
Nippon Telegraph & Telephone Public Corporation: *See*—
Ono, Toshiro; and Matsuo, Seitaro, 4,450,031, Cl. 156-345.000.
Nippondenso Co., Ltd.: *See*—
Furuhashi, Yasuhiro; Miyata, Yukinori; and Hishinuma, Osamu, 4,449,504, Cl. 123-447.000.
Okano, Reijiro; and Usami, Kiyoshi, 4,449,622, Cl. 192-84.00C.
Nishimuro, Atsushi: *See*—
Eto, Goro; Nishimuro, Atsushi; and Fukuda, Noriyoshi, 4,449,949, Cl. 445-24.000.
Nishiwaki, Toshihito: *See*—
Yasumatsu, Jun; Mori, Mamoru; Nishiwaki, Toshihito; and Owada, Akira, 4,449,752, Cl. 297-341.000.
Nishizako, Shizutaka; and Tazawa, Hiroaki, to Mitsubishi Denki Kabushiki Kaisha. Electromagnetic contactor means with improved arc runner. 4,450,328, Cl. 200-144.00R.
Nishizawa, Jun-ichi; Ohmi, Tadahiro; and Matsumoto, Seiji, to Fuji Photo Film Co., Ltd. Semiconductor image sensor. 4,450,466, Cl. 357-30.000.
Nishizawa, Junichi; and Ohmi, Tadahiro, to Handotai Kenkyu Shinkokai. Gallium arsenide ISL gate with punched-through bipolar driver transistor. 4,450,468, Cl. 357-51.000.
Nissan Motor Company, Limited: *See*—
Horiuchi, Tomofusa, 4,449,498, Cl. 123-339.000.
Kishi, Norimasa; Noso, Kazunori; and Takeuchi, Yasuhisa, 4,450,545, Cl. 367-198.000.
Kobayashi, Hiroshi, 4,450,501, Cl. 361-284.000.
Matsuda, Minoru, 4,449,614, Cl. 187-9.00R.
Seko, Yasutoshi; Yanagishima, Takayuki; and Fukasawa, Noburu, 4,450,438, Cl. 340-576.000.
Shori, Kaoru, 4,449,418, Cl. 74-475.000.
Suga, Masaaki; Morimoto, Yoshiro; and Hamada, Hideo, 4,449,618, Cl. 192-3.310.
Suzuki, Kunihiko, 4,449,604, Cl. 180-233.000.
Nitschko, Theodor: *See*—
Oberleitner, Gerhard; and Nitschko, Theodor, 4,449,730, Cl. 280-625.000.
Nitta Gelatin Kabushiki Kaisha: *See*—
Kohsaka, Yasuo; Nonaka, Yoshihiro; and Tachibana, Hideo, 4,449,816, Cl. 356-37.000.
Nitto Boseki Co., Ltd.: *See*—
Nagasawa, Takeshi; Kuroiwa, Katsumasa; and Takabayashi, Katsuyuki, 4,450,105, Cl. 260-112.50R.
NL Industries, Inc.: *See*—
Finlayson, Claude M., 4,450,095, Cl. 252-315.200.
Nayler, Douglas W. J., 4,449,854, Cl. 405-195.000.
Noble, Scott W., to Motorola Inc. Bit data operated squelch. 4,450,573, Cl. 375-104.000.
Nohda, Masao, to Nippon Kogaku K.K. Eye fundus observation apparatus. 4,449,798, Cl. 351-207.000.
Nomori, Hiroyuki: *See*—
Takei, Yoshiaki; Fujimaki, Yoshihide; and Nomori, Hiroyuki, 4,450,218, Cl. 430-59.000.
Nonaka, Yoshihiro: *See*—
Kohsaka, Yasuo; Nonaka, Yoshihiro; and Tachibana, Hideo, 4,449,816, Cl. 356-37.000.

Nonnenmann, Rolf: *See—*
Apitz, Siegfried; and Nonnenmann, Rolf, 4,450,349, Cl. 235-462.000.
Nooijen, Godefridus A. H.: *See—*
van de Leemput, Lambertus J. M. A.; and Nooijen, Godefridus A. H., 4,450,098, Cl. 502-107.000.
Nordica S.p.A.: *See—*
Baggio, Giorgio, 4,449,273, Cl. 24-68.0SK.
Balbinot, Renzo, 4,449,274, Cl. 24-70.0SK.
Northemann, Karl-Heinz; and Krahn, Heinrich. Toothbrush with two segments of bristles. 4,449,266, Cl. 15-167.00A.
Northern Telecom Limited: *See—*
Boleda, Alberto; and Thomas, Terence N., 4,450,556, Cl. 370-58.000.
Munter, Ernst A., 4,450,557, Cl. 370-58.000.
Northwestern University: *See—*
Chatterton, Robert T., 4,450,239, Cl. 436-510.000.
Noso, Kazunori: *See—*
Kishi, Norimasa; Noso, Kazunori; and Takeuchi, Yasuhisa, 4,450,545, Cl. 367-198.000.
Nugent, Edward L.: *See—*
Burns, James A.; and Nugent, Edward L., 4,449,529, Cl. 128-314.000.
Numata, Shigeaki: *See—*
Komatsu, Tatsuyoshi; Numata, Shigeaki; and Maruyama, Kazuhiro, 4,450,111, Cl. 260-369.000.
Nuyen, Trong L., to Thomson-CSF. GaAs Field effect transistor with a non-volatile memory. 4,450,462, Cl. 357-23.000.
Nuzzi, Francis J.; Leech, Edward J.; Charm, Richard W.; and Polichette, Joseph, to Kollmorgen Technologies Corporation. Process for sensitizing articles for metallization and resulting articles. 4,450,190, Cl. 427-304.000.
N.V. Raychem S.A.: *See—*
De Blauwe, Francis J. A. M. C., 4,450,023, Cl. 156-64.000.
O & K Orenstein & Koppel AG: *See—*
Trumper, Reinhard, 4,449,364, Cl. 60-403.000.
Obata, Tokio: *See—*
Kamioka, Toshiharu; Nakayama, Isao; Honda, Takeo; Kobayashi, Takashi; Obata, Tokio; Fujii, Katsutoshi; Kojima, Mikio; and Akiyoshi, Yuji, 4,450,162, Cl. 424-251.000.
Obenaus, Franz: *See—*
Jekel, Gerd; and Obenaus, Franz, 4,450,456, Cl. 346-140.00R.
Oberknapp, Wolfgang: *See—*
Kopec, Eduard; and Oberknapp, Wolfgang, 4,449,493, Cl. 123-196.00A.
Oberleitner, Gerhard; and Nitschko, Theodor, to TMC Corporation. Front jaw for a safety ski binding. 4,449,730, Cl. 280-625.000.
Oberman, Joel R., to RCA Corporation. Single chip microcomputer with external decoder and memory and internal logic for disabling the ROM and relocating the RAM. 4,450,524, Cl. 364-200.000.
Occidental Oil Shale, Inc.: *See—*
Ricketts, Thomas E.; and Sass, Allan, 4,449,753, Cl. 299-2.000.
Ochiai, Shinya, to Celanese Corporation. Control of anaerobic filter. 4,450,074, Cl. 210-96.100.
Ochoa, Carlos: *See—*
Kendrick, George B.; Duggan, George L.; and Ochoa, Carlos, 4,450,381, Cl. 313-579.000.
Ogata, Haruki; and Umeda, Hiroyuki, to Victor Company of Japan, Ltd. Tape cassette having a reel displacement limiting mechanism. 4,449,676, Cl. 242-198.000.
Ogawa, Kyosuke: *See—*
Shimizu, Isamu; Ogawa, Kyosuke; and Inoue, Eiichi, 4,450,185, Cl. 427-39.000.
Ogawa, Masahiro: *See—*
Hara, Tomihiro; Ogawa, Masahiro; and Yamashita, Masaaki, 4,450,209, Cl. 428-626.000.
Ogawa, Yasuhiro: *See—*
Nakata, Koreaki; Ueno, Jiro; and Ogawa, Yasuhiro, 4,450,049, Cl. 204-35.00N.
Ogawa, Youichiro: *See—*
Eto, Hiromichi; Kohmoto, Teruo; Kouda, Tadayuki; Ogawa, Youichiro; Sato, Susumu; Kuraishi, Tadayuki; and Nakashima, Toshiaki, 4,450,109, Cl. 260-243.300.
Ogura, Mitsuharu. Apparatus for the automatic ejection of concrete pipes. 4,449,912, Cl. 425-444.000.
Ohhara, Minoru: *See—*
Yoshikumi, Chikao; Ohmura, Yoshio; Hirose, Fumio; Ikuzawa, Masanori; Matsunaga, Kenichi; Fujii, Takayoshi; Ohhara, Minoru; and Ando, Takao, 4,450,156, Cl. 424-180.000.
Ohio Electronic Engravers, Inc.: *See—*
Buechler, Lester W., 4,450,486, Cl. 358-299.000.
Ohira, Tsuyoshi: *See—*
Takemae, Yoshihiro; Nakano, Tomio; Nakano, Masao; Tsuge, Norihisa; and Ohira, Tsuyoshi, 4,450,515, Cl. 363-60.000.
Ohmi, Tadahiro: *See—*
Nishizawa, Jun-ichi; Ohmi, Tadahiro; and Matsumoto, Seiji, 4,450,466, Cl. 357-30.000.
Nishizawa, Junichi; and Ohmi, Tadahiro, 4,450,468, Cl. 357-51.000.
Ohminato, Kiyoshi, to King Jim Co., Ltd. Binder assembly of the ring type. 4,449,840, Cl. 402-34.000.
Ohmura, Yoshio: *See—*
Yoshikumi, Chikao; Ohmura, Yoshio; Hirose, Fumio; Ikuzawa, Masanori; Matsunaga, Kenichi; Fujii, Takayoshi; Ohhara, Minoru; and Ando, Takao, 4,450,156, Cl. 424-180.000.
Ohta, Minoru; Hattori, Yutaka; Kawakami, Tomio; and Onoda, Michitosi, to Nippon Soken, Inc. Gas detecting sensor. 4,450,428, Cl. 338-34.000.
Ohta, Shuichi; and Kumagai, Atsuhiro, to Sony Corporation. Tape cassette. 4,449,677, Cl. 242-199.000.
Ohtaki, Shohei: *See—*
Sakurada, Nobuaki; Kawamura, Masaharu; Ohtaki, Shohei; Nakamoto, Soichi; and Shinoda, Nobuhiko, 4,449,805, Cl. 354-105.000.
Oiji, Yoshimasa: *See—*
Takizawa, Hiroshi; Oiji, Yoshimasa; and Kubo, Kazuhiro, 4,450,115, Cl. 260-465.00E.
Oishi, Kounosuke: *See—*
Koizumi, Hideaki; Yamada, Hideo; and Oishi, Kounosuke, 4,449,820, Cl. 356-307.000.
Oka, Taichi: *See—*
Arimura, Katsuo; Murakami, Shu; and Oka, Taichi, 4,450,275, Cl. 548-201.000.
Okada, Hitoshi; Takai, Kazuki; and Yamaguchi, Katsumi, to Clarion Co., Ltd. Interlocking gear control mechanism in magnetic tape recording/playing apparatus. 4,450,492, Cl. 360-105.000.
Okamoto, Katuhiko: *See—*
Fujita, Taira; Nakagawa, Hiroyuki; Sugihara, Mikio; Kobayashi, Kimiyuki; and Okamoto, Katuhiko, 4,450,114, Cl. 260-458.00C.
Okamura, Kouichi; Eriguchi, Yukio; Hagio, Katsushige; and Yamamoto, Setsuo, to Matsushita Electric Industrial Co. Corner holder for use with boxes. 4,449,662, Cl. 229-49.000.
Okamura, Yasushi; Manabe, Harukazu; and Sato, Norihide, to Matsushita Electric Industrial Co., Ltd. Ink ribbon cassette for printer. 4,449,838, Cl. 400-234.000.
Okano, Reijiro; and Usami, Kiyoshi, to Nippondenso Co., Ltd. Cover member for a magnetically operated clutch. 4,449,622, Cl. 192-84.00C.
Okazaki, Koshi: *See—*
Kondow, Takeshi; Okazaki, Koshi; Katsuhara, Yutaka; and Matsuoka, Kimiaki, 4,450.298, Cl. 568-437.000.
Oki Electric Industry Co., Ltd.: *See—*
Sasaki, Masao, 4,449,417, Cl. 74-409.000.
Okino, Yoshihiro: *See—*
Ito, Keisuke; Kashihara, Toshiaki; and Okino, Yoshihiro, 4,449,916, Cl. 425-174.400.
Okohira, Kazuo: *See—*
Nakao, Yasuyuki; Hoshijima, Yosuke; and Okohira, Kazuo, 4,450,005, Cl. 75-60.000.
Okuzawa, Tugio: *See—*
Kikuchi, Hideo; Ikeda, Sunao; Kakitani, Yohtaro; Hibi, Kunio; and Okuzawa, Tugio, 4,449,813, Cl. 355-14.00R.
Oldershaw, C. G. Peter: *See—*
Sienkiewicz, Boleslaw; Kramer, Franklin; Klein, Imrich; Oldershaw, C. G. Peter; and Chuang, Locus Y., 4,449,906, Cl. 425-131.100.
Oldham, William G., to Siemens Aktiengesellschaft. Monolithically integrated read-only memory. 4,450,537, Cl. 365-217.000.
Olin Corporation: *See—*
Gray, Thomas J., 4,450,056, Cl. 204-98.000.
Kelly, Pilar P., 4,450,057, Cl. 204-98.000.
Olschewski, Armin; Laszlofalvi, Zoltan; and Kunkel, Heinrich, to SKF Kugellagerfabriken GmbH. Lever mechanism with progressive transmission. 4,449,421, Cl. 74-516.000.
Olson, Jerry A.: *See—*
Kaiser, Hermann; and Olson, Jerry A., 4,449,401, Cl. 73-202.000.
Olsson, Christer H. K., to Dagens Nyheters AB. Method and device for counting sheet material. 4,450,352, Cl. 250-223.00R.
Olympus Optical Co., Ltd.: *See—*
Fujibayashi, Kenji, 4,450,413, Cl. 330-279.000.
Konomura, Yutaka; and Omagari, Yasuhiko, 4,449,518, Cl. 128-4.000.
Omae, Masanori: *See—*
Ishikawa, Kiyotsugu; Sone, Yoshiaki; Hashimoto, Susumu; Omae, Masanori; and Kunii, Takao, 4,450,475, Cl. 358-44.000.
Omagari, Yasuhiko: *See—*
Konomura, Yutaka; and Omagari, Yasuhiko, 4,449,518, Cl. 128-4.000.
O'Malley, Kevin C.: *See—*
Rodenberger, Charles M.; Sizer, Phillip S.; and O'Malley, Kevin C., 4,449,587, Cl. 166-323.000.
O'Malley, Mary A.: *See—*
Drake, Nancy J.; Hilston, Michael D.; and O'Malley, Mary A., 4,450,262, Cl. 526-234.000.
OMI International Corporation: *See—*
Arcilesi, Donald A., 4,450,191, Cl. 427-443.100.
Tremmel, Robert A., 4,450,051, Cl. 204-43.00T.
Ona, Isao; Harashima, Asao; Ozaki, Masaru; and Taki, Yoichiro, to Toray Silicone Company, Ltd. Composition used to groom hair. 4,450,152, Cl. 424-70.000.
Ono, Tadahiro: *See—*
Kawamura, Akira; and Ono, Tadahiro, 4,450,395, Cl. 318-700.000.
Ono, Toshiro; and Matsuo, Seitaro, to Nippon Telegraph & Telephone Public Corporation. Ion shower apparatus. 4,450,031, Cl. 156-345.000.
Onoda, Michitosi: *See—*
Ohta, Minoru; Hattori, Yutaka; Kawakami, Tomio; and Onoda, Michitosi, 4,450,428, Cl. 338-34.000.
Oowada, Siniti: *See—*
Miyoshi, Tadahiko; Yamazaki, Takeo; Maeda, Kunihiro; Takahashi, Ken; and Oowada, Siniti, 4,450,426, Cl. 338-21.000.

Optikon Oftalmologia, S.p.A.: *See*—
Ranalli, Domenico, 4,449,550, Cl. 137-624.130.
Orlov, Naum Y.; and Dotsenko, Taras P., to Vsesojuzny Proektno-Izyskatelsky I Nauchno-Issledovatelsky Institut "Gidropoekt" Imeni S.Ya. Zhuka. Device for breaking monolithic structures by pulsewise liquid pressure. 4,449,754, Cl. 299-21.000.
Osaka, Susumu: *See*—
Toda, Minoru; and Osaka, Susumu, 4,449,563, Cl. 160-184.000.
Oshikoshi, Yuji; and Agano, Toshitaka, to Fuji Photo Film Co., Ltd. Image scanning and recording method. 4,450,485, Cl. 358-298.000.
Oshima, Shigeru: *See*—
Wong, Wan C.; and Oshima, Shigeru, 4,449,806, Cl. 354-121.000.
Ostarly, Adam R. Wind vane hanging plant container. 4,449,324, Cl. 47-67.000.
Ostermann, Bernd; and Lissner, Paul, to Licentia Patent-Verwaltungs GmbH. Dialing device with calling number and identification memory and method for using same. 4,450,320, Cl. 179-5.00R.
Ostertag, Klaus: *See*—
Ross, Dieter; and Ostertag, Klaus, 4,450,359, Cl. 250-572.000.
Osumi, Yoshihiro: *See*—
Saito, Chuichi; Teranishi, Katsuya; Baba, Katsuyoshi; and Osumi, Yoshihiro, 4,449,623, Cl. 198-335.000.
Oswald, Alexis A.; Jermansen, Torris G.; Westner, Andrew A.; and Huang, I-Der, to Exxon Research and Engineering Co. Homogeneous hydroformylation catalysis with silyl substituted alkyl diaryl phosphine metal complexes. 4,450,299, Cl. 568-454.000.
Oswald, Rudolph G.: *See*—
Castleman, B. Wayne; Donehoo, Robert F.; Oswald, Rudolph G.; Reed, Kenneth L.; and Shipley, George H., 4,450,409, Cl. 324-460.000.
Ota, Naoto: *See*—
Kohzai, Yoshinori; Fujioka, Yoshiki; and Ota, Naoto, 4,450,393, Cl. 318-592.000.
Ota, Yozo: *See*—
Nakamura, Norihiko; Ito, Takaaki; Katou, Takashi; Ota, Yozo; and Morino, Toshiharu, 4,450,117, Cl. 261-39.00A.
Otis Engineering Corporation: *See*—
Rodenberger, Charles M.; Sizer, Phillip S.; and O'Malley, Kevin C., 4,449,587, Cl. 166-323.000.
Oude Alink, Bernardus A.: *See*—
Thompson, Neil E. S.; Redmore, Derek; Oude Alink, Bernardus A.; and Outlaw, Benjamin T., 4,450,137, Cl. 422-12.000.
Thompson, Neil E. S.; Redmore, Derek; Oude Alink, Bernardus A.; and Outlaw, Benjamin T., 4,450,138, Cl. 422-12.000.
Outboard Marine Corporation: *See*—
Ferguson, Arthur R., 4,449,945, Cl. 440-53.000.
Outlaw, Benjamin T.: *See*—
Thompson, Neil E. S.; Redmore, Derek; Oude Alink, Bernardus A.; and Outlaw, Benjamin T., 4,450,137, Cl. 422-12.000.
Thompson, Neil E. S.; Redmore, Derek; Oude Alink, Bernardus A.; and Outlaw, Benjamin T., 4,450,138, Cl. 422-12.000.
Overberger, Charles G.: *See*—
Leistner, William E.; and Overberger, Charles G., 4,450,248, Cl. 524-99.000.
Owada, Akira: *See*—
Yasumatsu, Jun; Mori, Mamoru; Nishiwaki, Toshihito; and Owada, Akira, 4,449,752, Cl. 297-341.000.
Owen, Hartley: *See*—
Wright, Bernard S.; Owen, Hartley; and Hsia, Chung H., 4,450,311, Cl. 585-413.000.
Owen, William H., III, to Xicor, Inc. Integrated circuit testing apparatus. 4,450,402, Cl. 324-73.00R.
Owens-Corning Fiberglas Corporation: *See*—
Hager, Thomas P.; and Ferguson, Larry W., 4,450,197, Cl. 428-232.000.
Owens-Illinois, Inc.: *See*—
Irwin, George W.; and Mumford, Eustace H., 4,449,996, Cl. 65-305.000.
Ozaki, Masaru: *See*—
Ona, Isao; Harashima, Asao; Ozaki, Masaru; and Taki, Yoichiro, 4,450,152, Cl. 424-70.000.
Ozawa, Masakazu: *See*—
Sugitani, Hiroshi; Ozawa, Masakazu; Matsuda, Hiroto; Ikeda, Masami; and Matsumoto, Haruyuki, 4,450,455, Cl. 346-140.0PQ.
Ozer, Theodore: *See*—
Yankovoy, Alexander; and Ozer, Theodore, 4,449,865, Cl. 408-1.00R.
Ozkan, Adil N., to Biostar Medical Products, Inc. Immunoassay for determination of immune complexes with polymer-coated plastic base. 4,450,231, Cl. 435-7.000.
Pacaud, Andre: *See*—
Thirion, Andre; Sorba, Antoine; Dany, Jean-Claude; Pacaud, Andre; and Attal, Gerard, 4,449,385, Cl. 70-277.000.
Pacific Electricord Company: *See*—
Carmo, Robert A.; and Dietz, Ernest W., 4,449,776, Cl. 339-91.00R.
Paek, Un C.: *See*—
Andrejco, Matthew J.; Paek, Un C.; and Schroeder, Charles M., Jr., 4,450,333, Cl. 219-10.49R.
Painter, Walter C.; Luttmer, David J.; and Galloway, Alvin J., to Rockwell International Corporation. Electronic AC induction motor brake. 4,450,397, Cl. 318-762.000.
Palomar, Juan M.; and Bird, Gary M. Penile prosthesis device. 4,449,520, Cl. 128-79.000.
Pankratz, Orlando K. Log handling tool. 4,449,743, Cl. 294-11.000.
Panzer, Jack S. Sexual aid. 4,449,521, Cl. 128-79.000.
Park, Sang-Woo, to Korean Advanced Institute of Science and Technology. Preparation of ethambutol-diisoniazide methane sulfonic acid salt. 4,450,274, Cl. 546-262.000.
Parker, John A.: *See*—
Achar, Bappalige N.; Fohlen, George M.; and Parker, John A., 4,450,268, Cl. 528-327.000.
Parker, Samuel A., Jr.: *See*—
Marshall, Charles W.; Lineberger, William F.; and Parker, Samuel A., Jr., 4,449,540, Cl. 131-290.000.
Parker Tobacco Company: *See*—
Marshall, Charles W.; Lineberger, William F.; and Parker, Samuel A., Jr., 4,449,540, Cl. 131-290.000.
Parkersburg Tank, Division of Maloney Crawford Corporation: *See*—
Bubb, Charles E.; and Mauch, Fred E., 4,449,339, Cl. 52-195.000.
Parkin, Trevor D.: *See*—
Reed, Norman L.; and Parkin, Trevor D., 4,449,647, Cl. 222-153.000.
Parry, John C. Fabric rewind system. 4,449,675, Cl. 242-56.200.
Patterson, Raymond B., III, to Harris Corporation. High temperature current mirror amplifier. 4,450,414, Cl. 330-288.000.
Paul Hettich & Co.: *See*—
Sundermeier, Gunter, 4,449,269, Cl. 16-50.000.
Pauze, Denis R., to General Electric Company. Coating compositions. 4,450,258, Cl. 525-440.000.
Pawloski, Chester E.; and Ginter, Sally P., to Dow Chemical Company, The. Phosphorous-containing polyether polyols. 4,450,280, Cl. 549-221.000.
Paxson, Timm E., to Shell Oil Company. Butenyl acetate production. 4,450,286, Cl. 560-241.000.
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Paxson, Timm E., to Shell Oil Company. Butenyl acetate production. 4,450,288, Cl. 560-241.000.
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Payette, Lionel J.: *See*—
Saunders, Hollis S.; Carmer, Richard V.; and Payette, Lionel J., 4,449,290, Cl. 29-596.000.
Pays, Gerard J. P. Device for minimizing far-end crosstalk between half-duplex digital transmission lines. 4,450,555, Cl. 370-31.000.
Peake, Clinton J.; Harnish, Wayne N.; and Davidson, Bruce L., to FMC Corporation. Mono-5-substituted-3-chloro-4H-1,2,6-thiadiazin-4-one antifungal agents. 4,450,269, Cl. 544-8.000.
Pearce, Jai: *See*—
Pitzer, Ken; Cunningham, James F.; and Pearce, Jai, 4,449,701, Cl. 266-218.000.
Pearson, Bernard A.: *See*—
Snellman, Donald L.; and Pearson, Bernard A., 4,449,706, Cl. 271-290.000.
Pease, Roger F. W.: *See*—
Tuckerman, David B.; and Pease, Roger F. W., 4,450,472, Cl. 357-82.000.
Pechiney: *See*—
Floreancig, Antoine; Siffert, Bernard; and Trescol, Jean-Jacques, 4,450,143, Cl. 423-10.000.
Pellionisz, Andras J.: *See*—
Llinas, Rodolfo R.; and Pellionisz, Andras J., 4,450,530, Cl. 364-513.000.
Pem Fountain Co.: *See*—
Micha, Peter, 4,450,511, Cl. 362-267.000.
Penco, Eugenio: *See*—
Marchetti, Renato; Penco, Eugenio; and Perito, Ugo, 4,450,566, Cl. 372-38.000.
Pennsylvania Engineering Corporation: *See*—
Pitzer, Ken; Cunningham, James F.; and Pearce, Jai, 4,449,701, Cl. 266-218.000.
Pennwalt Corporation: *See*—
Caldwell, John W., 4,449,967, Cl. 494-54.000.
Henderson, Matthew P., 4,449,351, Cl. 53-569.000.
Pennzoil Company: *See*—
Kidwell, Louis E., Jr.; and Holcomb, Dysart E., 4,450,069, Cl. 208-255.000.
Pensa, Inc.: *See*—
Stubblefield, Jerry D., 4,449,307, Cl. 36-32.00R.
Penwalt Corporation: *See*—
Malzahn, Dale E., 4,450,047, Cl. 203-15.000.
Perez, Lucien: *See*—
Cessou, Maurice; and Perez, Lucien, 4,449,850, Cl. 405-60.000.
Perito, Ugo: *See*—
Marchetti, Renato; Penco, Eugenio; and Perito, Ugo, 4,450,566, Cl. 372-38.000.
Perkin-Elmer Corporation, The: *See*—
Schwartz, Arnold, 4,450,574, Cl. 377-2.000.
Perlstein, Jerome H.: *See*—
Detty, Michael R.; and Perlstein, Jerome H., 4,450,217, Cl. 430-58.000.
Permsky Filial Vsesojuznogo Nauchno-Issledovatelskogo Instituta Burovoi Tekhniki: *See*—
Nikomarov, Samuil S.; Kochnev, Anatoly M.; Goldobin, Vladimir B.; Sarapulov, Jury M.; and Valdman, Isaak Y., 4,449,953, Cl. 464-19.000.
Perrott, Lynn F., to Corbett, Scott S., Jr., a part interest. Apparatus for carrying empty cargo containers. 4,449,882, Cl. 414-665.000.
Perry, Michael K. Intravenous anchor and wound shield. 4,449,975, Cl. 604-179.000.

Person, Herman R.; Hesse, Joseph F.; and Hall, Steven R. Dot matrix plasma display and method for driving same. 4,450,441, Cl. 340-773.000.

Peruth, Gunther, to Siemens Aktiengesellschaft. Switched mode power supply. 4,450,514, Cl. 363-37.000.

Pesa, Frederick A.: *See*—
Fox, Joseph R.; Curatolo, Benedict S.; and Pesa, Frederick A., 4,450,310, Cl. 585-400.000.

Peters, Thomas E.; Gustafson, John C.; and Wong, Boon, to GTE Laboratories Incorporated. Method of making electrical contacts. 4,450,135, Cl. 419-12.000.

Peterson, Daniel G.; Erickson, John W.; and Robinson, Horace M., to Kobe, Inc. Sequenced production incorporating fluid rod pump. 4,449,582, Cl. 166-64.000.

Peterson, John F.; and Bartlett, Allen J., to Helix Technology Corporation. Reduced vacuum cryopump. 4,449,373, Cl. 62-55.500.

Peterson, Walter L., to Select Laboratories, Inc. Poultry vaccination system. 4,449,968, Cl. 604-24.000.

Petiot, Gerard L. R.: *See*—
de Pommery, Bertrand J. C. H.; Petiot, Gerard L. R.; Vergne, Jean-Claude E.; and Goupil, Jean-Paul C., 4,449,775, Cl. 339-75.0MP.

Petit, Jean-Pierre; and Maitre, Xavier. Distributed arithmetic digital processing circuit. 4,450,533, Cl. 364-724.000.

Petke, Frederick D.: *See*—
McConnell, Richard L.; Meyer, Max F., Jr.; and Petke, Frederick D., 4,450,250, Cl. 524-141.000.

Petrocci, Alfonso N.: *See*—
Green, Harold A.; Petrocci, Alfonso N.; and Dudzinski, Zdzislaw W., 4,450,174, Cl. 424-329.000.

Petrolite Corporation: *See*—
Thompson, Neil E. S.; Redmore, Derek; Oude Alink, Bernardus A.; and Outlaw, Benjamin T., 4,450,137, Cl. 422-12.000.
Thompson, Neil E. S.; Redmore, Derek; Oude Alink, Bernardus A.; and Outlaw, Benjamin T., 4,450,138, Cl. 422-12.000.

Pettersson, Birger; and Karlsson, Kurt, to Svenska Rotor Maskiner Aktiebolag. Regenerative heat exchangers. 4,449,573, Cl. 165-10.000.

Pfizer Inc.: *See*—
Celmer, Walter D.; Cullen, Walter P.; Shibakawa, Riichiro; and Tone, Junsuke, 4,450,237, Cl. 435-253.000.
Dudek, David M.; and Lambert, Mark A., 4,450,136, Cl. 420-590.000.
Reese, Russell L., 4,449,929, Cl. 433-56.000.

Pfrogner, Gerd: *See*—
Fuhrer, Egon; Kleinert, Dieter; Pfrogner, Gerd; and Egg, Max, 4,449,691, Cl. 251-85.000.

Phaneuf, Robert A.: *See*—
La Torre, Richard R.; and Phaneuf, Robert A., 4,450,451, Cl. 343-765.000.

Philipp, Herbert R.: *See*—
Pimbley, Joseph M.; and Philipp, Herbert R., 4,450,465, Cl. 357-30.000.

Philippossian, Georges, to Societe d'Assistance Technique pour Produits Nestle S.A. Process for the preparation of 1,3,7-trialkyl xanthines and di(3,7-dimethylxanthin-1-yl)methane as a medicament. 4,450,163, Cl. 424-253.000.

Phillips Petroleum Company: *See*—
Davis, Thomas T., 4,450,370, Cl. 307-475.000.
Drake, Charles A., 4,450,303, Cl. 568-574.000.
Eastman, Alan D.; and Kimble, James B., 4,450,313, Cl. 585-624.000.
Hopkins, Thomas R., 4,450,153, Cl. 424-94.000.
Kukes, Semyon, 4,450,068, Cl. 208-251.00H.
Lindstrom, Merlin R.; Macdonell, Gary D.; Louthan, Rector P.; and Kubicek, Donald H., 4,450,102, Cl. 252-542.000.

Phillips, Robert A.: *See*—
Clancy, Steven J.; and Phillips, Robert A., 4,450,446, Cl. 343-7.700.

Phoenix Chemical Corporation: *See*—
Leistner, William E.; and Overberger, Charles G., 4,450,248, Cl. 524-99.000.

Pieniak, Heinz A.; and Repke, Virginia L., to Johnson & Johnson Baby Products Company. Method of forming a conformable garment with "killed" elastic portions. 4,450,026, Cl. 156-164.000.

Pilat, John F.; Richmond, Michael S.; Wallach, Walter A., Jr.; and Schleimer, Stephen I., to Data General Corporation. Apparatus for deriving addresses of data using displacements from base addresses which change only on call and return. 4,450,522, Cl. 364-200.000.

Pilat, John F.; Czerniakiewicz, Anastasia J.; Kinder, David B.; and Davidian, Gary, to Data General Corporation. Apparatus for deriving the current length of varying-length data items in a digital data processing system. 4,450,523, Cl. 364-200.000.

Pilatzki, Bernd. Anti-crash apparatus for motorvehicles. 4,449,728, Cl. 280-731.000.

Pimbley, Joseph M.; and Philipp, Herbert R., to General Electric Company. Radiation transmissive electrode structure. 4,450,465, Cl. 357-30.000.

Pioneer Electronic Corporation: *See*—
Ikedo, Yuji; Kenmotsu, Isami; and Isobe, Nobuyuki, 4,450,549, Cl. 369-75.100.

Piramoon, Alireza, to Beckman Instruments, Inc. Centrifuge rotor balancing bosses. 4,449,966, Cl. 494-20.000.

Pirelli General Public Limited Company: *See*—
Baskwell, John A.; and Larrive, Christopher, 4,450,317, Cl. 174-27.000.

Pirolli, Robert J. Bicycle storage trunk. 4,449,653, Cl. 224-35.000.

Pissiotas, Georg: *See*—
Fory, Werner; Martin, Henry; and Pissiotas, Georg, 4,450,000, Cl. 71-105.000.

Pitney Bowes Inc.: *See*—
Gavronsky, German, 4,450,037, Cl. 156-441.500.

Pittman, Edgar H.: *See*—
Moore, James R.; Schroder, William J.; Warner, Charles E.; and Pittman, Edgar H., 4,449,355, Cl. 57-284.000.

Pitzer, Ken; Cunningham, James F.; and Pearce, Jai, to Pennsylvania Engineering Corporation. Tuyere for the injection of gases into a metallurgical vessel. 4,449,701, Cl. 266-218.000.

Piwonka, Thomas S.: *See*—
Blazek, William S.; and Piwonka, Thomas S., 4,449,567, Cl. 164-137.000.

Pleska, Jean-Pierre: *See*—
Voituron, Georges; and Pleska, Jean-Pierre, 4,450,125, Cl. 264-13.000.

Plester, Karl-Heinz: *See*—
Terhorst, Gunter; Plester, Karl-Heinz; Rosenberg, Harry; and Eggenstein, Friedrich, 4,449,859, Cl. 405-291.000.

Pletka, Hans-Dieter: *See*—
Domesle, Rainer; Volker, Herbert; Koberstein, Edgar; and Pletka, Hans-Dieter, 4,450,244, Cl. 502-185.000.

Pluquet, Alain A.: *See*—
Forestier, Alexandre; Pluquet, Alain A.; Rosa, Roger A.; Tabet, Mansour; and Teysseyre, Pierre M., 4,449,607, Cl. 181-213.000.

Pokorny, Erich: *See*—
Beck, Ernst; Lenard, Peter; and Pokorny, Erich, 4,449,427, Cl. 76-77.000.

Polar Research, Inc.: *See*—
Ellingson, Gary L.; and Miller, Wendell E., 4,450,450, Cl. 343-758.000.

Polichette, Joseph: *See*—
Nuzzi, Francis J.; Leech, Edward J.; Charm, Richard W.; and Polichette, Joseph, 4,450,190, Cl. 427-304.000.

Pollak, Richard B., to Lee Pharmaceuticals, Inc. Endodontic filling and sealing composition. 4,449,938, Cl. 523-116.000.

Polymatic Investment Corp., N.V.: *See*—
Cho, Edward, 4,450,264, Cl. 526-279.000.

Pompon, Jean-Bernard: *See*—
Laroche, Paul; and Pompon, Jean-Bernard, 4,450,189, Cl. 427-236.000.

Pontini, Giovanni, to Teksid, S.p.A. Automatic unit for hot molding and trimming of metal parts. 4,449,390, Cl. 72-405.000.

Porel, Louis C., to Hydro Rene Leduc. Prestressed assembled oleopneumatic accumulators. 4,449,552, Cl. 138-30.000.

Porter, Robert E. Walking foot feed for sewing machines. 4,449,464, Cl. 112-311.000.

Potz, Gunther: *See*—
Gotze, Volkmar; and Potz, Gunther, 4,450,561, Cl. 371-37.000.

PPG Industries, Inc.: *See*—
Koelbl, Harold M., 4,449,995, Cl. 65-158.000.
Lavanish, Jerome M.; and Van Gemert, Barry, 4,449,998, Cl. 71-92.000.
Sathe, Avinash T., 4,450,284, Cl. 560-163.000.
Taglianetti, Philip C.; and Burkard, Andrew M., 4,449,341, Cl. 52-235.000.

Prayner, Timothy F.: *See*—
Dietrick, Earl T.; and Prayner, Timothy F., 4,450,341, Cl. 219-137.520.

Preformed Line Products Company: *See*—
Koncelik, Kenneth J.; and Goetter, Erwin H., 4,449,768, Cl. 339-14.00R.

Preiss, Michael; Gau, Wolfgang; and Behre, Horst, to Bayer Aktiengesellschaft. Preparation of o-nitrobenzaldehyde. 4,450,297, Cl. 568-424.000.

Prem, Dorothy C.: *See*—
Isley, Ralph E.; Prem, Dorothy C.; and Duke, June T., 4,450,254, Cl. 524-399.000.

Price, David W.: *See*—
Litvin, Robert L.; and Price, David W., 4,449,741, Cl. 285-153.000.

Price, James W. Transverse saddle type boat cradle. 4,449,846, Cl. 405-7.000.

Price, Ralph J. Oil drain valve with remote control means. 4,449,613, Cl. 184-1.500.

Prickett, Michael J.: *See*—
Wehner, Donald R.; and Prickett, Michael J., 4,450,444, Cl. 343-5.0CM.

Priesnitz, Uwe: *See*—
Forster, Heinz; and Priesnitz, Uwe, 4,450,308, Cl. 568-637.000.

Procter, John H.: *See*—
Schulz, Walter A.; and Procter, John H., 4,449,468, Cl. 114-104.000.

Profet, Gary A.: *See*—
Hampton, Dean A.; Jacobsen, Christian C.; and Profet, Gary A., 4,450,558, Cl. 370-106.000.

Prohaska, Hans: *See*—
Andrei-Alexandru, Marcel; and Prohaska, Hans, 4,450,390, Cl. 318-282.000.

Promecam Sisson-Lehmann: *See*—
Cros, Pierre, 4,449,389, Cl. 72-389.000.

Pross, Gerhard; and Rochlitzer, Frank, to Hewlett-Packard GmbH. Respiration monitor. 4,449,537, Cl. 128-723.000.

Protecon B.V.: *See*—
van Haren, Lambertus F. W., 4,449,406, Cl. 73-433.000.

Proud, Joseph M.; Riseberg, Leslie A.; Byszewski, Wojciech W.; and Budinger, A. Bowman, to GTE Laboratories Incorporated. Multi-electrode array for a beam mode fluorescent lamp. 4,450,380, Cl. 313-485.000.

Prueitt, Melvin L. Leg extension jumpers. 4,449,256, Cl. 3-4.000.

PTX Pentronix, Inc.: *See*—
DeSantis, Raymond P.; and Puffer, Herbert J., Jr., 4,450,127, Cl. 264-56.000.

Puchalski, Chester: *See*—
Bristol, James A.; and Puchalski, Chester, 4,450,164, Cl. 424-256.000.

Pudick, Sheldon: *See*—
Feigenbaum, Haim; Pudick, Sheldon; and Singh, Rajindar, 4,450,212, Cl. 429-35.000.

Puffer, Herbert J., Jr.: *See*—
DeSantis, Raymond P.; and Puffer, Herbert J., Jr., 4,450,127, Cl. 264-56.000.

Pugh, Harold, to United Kingdom Atomic Energy Authority. Extensometers. 4,449,413, Cl. 73-780.000.

Pultman, Martin D. Accessories for wheelchairs and the like. 4,449,750, Cl. 297-188.000.

PUMA-Sportschuhfabriken Rudolf Dassler KG: *See*—
Cavanagh, Peter R., 4,449,306, Cl. 36-30.00R.

Purdes, Andrew J., to Texas Instruments Incorporated. Plasma etch chemistry for anisotropic etching of silicon. 4,450,042, Cl. 156-643.000.

Puretic, Mario J. Purse ring control apparatus for fishing vessels. 4,449,315, Cl. 43-8.000.

Puropore, Inc.: *See*—
Kesting, Robert E., 4,450,126, Cl. 264-41.000.

Putz, Wilhelm, to Siemens Aktiengesellschaft. Hand-operated apparatus for peeling off the outer jacket layer of electric lines and cables. 4,449,298, Cl. 30-90.100.

Q.P. Corporation: *See*—
Saito, Hisatoshi; Fujii, Shuzo; Takase, Itaru; Nakamura, Akihiko; and Hara, Yoshihiro, 4,449,861, Cl. 406-39.000.

Quadrant Drive BV: *See*—
Carden, John C., 4,449,425, Cl. 74-804.000.

Queneau, Paul B.: *See*—
Laferty, John M.; Queneau, Paul B.; and Beckstead, Leo W., 4,450,144, Cl. 423-54.000.

Quigley, William B.: *See*—
McCrory, William W.; Quigley, William B.; and Garnett, William A., 4,449,473, Cl. 114-354.000.

Quigley, William D.; and Nelson, Philip H. Circuit for producing noise generation for sound masking. 4,450,321, Cl. 179-1.50M.

R. Alkan & Cie: *See*—
Lerouge, Andre; Andre, Jean-Louis; and Coutin, Pierre, 4,449,920, Cl. 431-91.000.

R. J. Reynolds Tobacco Company: *See*—
Mays, Charles D.; Wagoner, Max A.; and Williard, Daniel G., 4,449,541, Cl. 131-302.000.

Radosay, Jon J.; and Wilson, John R., to John Crane Houdaille, Inc. Emergency seal. 4,449,719, Cl. 277-192.000.

Raether, Roger, to Hi-Tec, Inc. Rotary coupling. 4,449,739, Cl. 285-14.000.

Ragas, Frank J.; Minnis, Ralph L.; and Beauchamp, Gerson E., to DeSoto, Inc. Electrographic coatings containing acrylamide copolymers. 4,450,203, Cl. 428-514.000.

Railroad Concrete Crosstie Corporation: *See*—
Hales, Harvey E.; and Fredrick, Edmund R., 4,449,666, Cl. 238-84.000.

Rakes, James M.: *See*—
Goff, Willie, Jr.; Rakes, James M.; and Williams, Errol R., 4,450,342, Cl. 219-216.000.

Ramser, Robert A., to Aluminum Company of America. Apparatus for control of particle size in the production of atomized metal. 4,449,902, Cl. 425-7.000.

Ranalli, Domenico, to Optikon Oftalmologia, S.p.A., 5n 20 Paul Fields McAulay, Fields, Fisher et al. 405 Lexington Ave. New York, NY 10174 S. Control system for intraocular surgical device. 4,449,550, Cl. 137-624.130.

Rand, George: *See*—
Denaro, Alfred; and Rand, George, 4,450,544, Cl. 367-176.000.

Ranftl, Joseph C.: *See*—
Hansen, Don; and Ranftl, Joseph C., 4,449,564, Cl. 160-166.00A.

Rapid Packaging Services Pty. Ltd.: *See*—
Mansell, George B., 4,449,452, Cl. 101-382.0MV.

Rasmussen GmbH: *See*—
Sauer, Heinz; Stichel, Willi; and Wachter, Gerhard, 4,449,429, Cl. 81-9.300.

Rath, Heinrich B.; and Thomas, Alfred W., to Lucas Industries Limited. Hydraulic actuator for a vehicle internal shoe-drum brake. 4,449,757, Cl. 303-6.00C.

Rawlings, David E., to Consort Aluminium Limited. Adjustable window assembly. 4,449,325, Cl. 49-192.000.

Ray-Chaudhuri, Dilip K.: *See*—
Chiao, Wen B.; and Ray-Chaudhuri, Dilip K., 4,450,261, Cl. 526-214.000.

Raychem Corporation: *See*—
Doljack, Frank A.; and Middleman, Lee M., 4,450,496, Cl. 361-58.000.

Raytheon Company: *See*—
Bowen, Robert F.; and Martel, Thomas J., 4,450,334, Cl. 219-10.55E.

Kliger, Isaac E.; Brown, William C., Jr.; and Goldstein, David S., 4,450,410, Cl. 328-155.000.

La Torre, Richard R.; and Phaneuf, Robert A., 4,450,451, Cl. 343-765.000.

Macaulay, Alexander, 4,450,062, Cl. 204-298.000.

Matthews, James B., 4,449,824, Cl. 356-350.000.

RCA Corporation: *See*—
Beyers, Billy W., Jr., 4,450,587, Cl. 455-182.000.
Bismarck, Otto H., 4,450,371, Cl. 307-475.000.
Hughes, Larry M., 4,450,548, Cl. 369-71.000.
Kelleher, Kevin C., 4,450,394, Cl. 318-696.000.
Marcantonio, Angelo R., 4,450,552, Cl. 369-240.000.
Oberman, Joel R., 4,450,524, Cl. 364-200.000.
Schwarzmann, Alfred, 4,450,419, Cl. 333-164.000.
Sterzer, Fred, 4,450,550, Cl. 369-126.000.
Tallant, James C., II, 4,450,476, Cl. 358-74.000.
Toda, Minoru; and Osaka, Susumu, 4,449,563, Cl. 160-184.000.
Wacyk, Ihor T.; and Stewart, Roger G., 4,450,562, Cl. 371-51.000.

Read, William A. Device for preventing theft of motor vehicles. 4,449,605, Cl. 180-287.000.

Ream, Lloyd W., to United States of America, National Aeronautics and Space Administration. Diesel engine catalytic combustor system. 4,449,370, Cl. 60-606.000.

Rebmann, Rolf: *See*—
Langwieder, Rolf; Rebmann, Rolf; Stotz, Erich; Wierschem, Franz-Rudolf; and Trick, Fred, 4,449,603, Cl. 180-232.000.

Redeker, Werner; and Uhlig, Uwe, to Hauni-Werke Korber & Co. KG. Machine tool feed screw drive. 4,449,988, Cl. 51-165.800.

Redmore, Derek: *See*—
Thompson, Neil E. S.; Redmore, Derek; Oude Alink, Bernardus A.; and Outlaw, Benjamin T., 4,450,137, Cl. 422-12.000.
Thompson, Neil E. S.; Redmore, Derek; Oude Alink, Bernardus A.; and Outlaw, Benjamin T., 4,450,138, Cl. 422-12.000.

Reece, Jack E., to Minnesota Mining and Manufacturing Company. Stabilization of latent images in photothermographic elements. 4,450,229, Cl. 430-523.000.

Reed, Geoffrey R.: *See*—
Laws, William R.; and Reed, Geoffrey R., 4,449,575, Cl. 165-82.000.

Reed, Kenneth L.: *See*—
Castleman, B. Wayne; Donehoo, Robert F.; Orwald, Rudolph G.; Reed, Kenneth L.; and Shipley, George H., 4,450,409, Cl. 324-460.000.

Reed, Norman L.; and Parkin, Trevor D., to Bespak Industries Limited. Handle assembly for a pressurized dispensing container. 4,449,647, Cl. 222-153.000.

Reed, Ronald G.; Schmuckal, Robin R.; and McCullough, Robert K., to Hewlett-Packard Company. CRT With internal thermionic valve for high voltage control. 4,450,387, Cl. 315-375.000.

Reese, Eckart: *See*—
Schmidt, Manfred; Wank, Joachim; Reese, Eckart; Freitag, Dieter; Wangermann, Klaus; and Cohnen, Wolfgang, 4,450,249, Cl. 524-132.000.

Reese, Russell I., to Pfizer Inc. Denture alignment kit. 4,449,929, Cl. 433-56.000.

Reicherts, James E., to United States Gypsum Company. Temporary restraining clamp for wallboard. 4,449,338, Cl. 52-127.800.

Reichman, William, Jr., to Custom Wrought Products, Co. Sleeve bracket. 4,449,842, Cl. 403-25.000.

Reiling, Walter S., to Meritus Industries, Inc. Crib toy. 4,449,321, Cl. 46-113.000.

Reisman, Arnold; Berkenblit, Melvin; and Merz, Charles J., III, to International Business Machines Corporation. Vertical wall elevated pressure heat dissipation system. 4,449,580, Cl. 165-104.340.

Reithel, Raymond F.; and Weiss, Armin K., to Eastman Kodak Company. Color filter elements comprising hexaalkoxymethylmelamine barrier layers. 4,450,215, Cl. 430-7.000.

Renato, Rinaldi, to Uniox SRL Welding & Cutting. Autogenous portable welding apparatus. 4,449,698, Cl. 266-48.000.

Renault, Guy, to Compagnie Industrielle des Lasers Cilas Alcatel. Apparatus for measuring in situ the state of oxidation-reduction of a living organ. 4,449,535, Cl. 128-634.000.

Renault Vehicules Industries: *See*—
Reynaud, Jean-Paul, 4,449,492, Cl. 123-193.0CH.

REPA Feinstanzwerk GmbH: *See*—
Fohl, Artur, 4,449,443, Cl. 91-392.000.

Repke, Virginia L.: *See*—
Pieniak, Heinz A.; and Repke, Virginia L., 4,450,026, Cl. 156-164.000.

Research Corporation: *See*—
Kabalka, George W., 4,450,149, Cl. 424-1.100.

Respiratory Care, Inc.: *See*—
Cruz, Exequiel D., 4,449,984, Cl. 604-319.000.

Rettinger, Anton: *See*—
Toerner, Ludger; Garvens, Dieter; Hager, Gunter; and Rettinger, Anton, 4,449,742, Cl. 285-236.000.

Reynaud, Jean-Paul, to Renault Vehicules Industries. Attachment for a heat shield. 4,449,492, Cl. 123-193.0CH.

Reynolds, George O., to Honeywell Inc. Optical lithographic system. 4,450,358, Cl. 250-492.100.

Reynolds Metals Company: *See*—
Johnston, Thomas J.; Richards, Nolan E.; and Tabereaux, Alton T., 4,450,063, Cl. 204-400.000.
Tabereaux, Alton T., 4,450,054, Cl. 204-67.000.

Rhodes, Eugene E., to Ford Motor Company. Drain construction for a radiator. 4,449,692, Cl. 251-144.000.

Rhodes, John M.: *See*—
Luke, Roger D.; and Rhodes, John M., 4,449,296, Cl. 29-883.000.
Rhythm Watch Co., Ltd.: *See*—
Itami, Masaru; and Tatusawa, Kunio, 4,449,831, Cl. 368-165.000.
Ricciardi, Ronald J.; and Rudolph, Otto J., to Acrison, Incorporated. Flexure weighing system. 4,449,597, Cl. 177-256.000.
Rice, David A.; Greenbaum, Robert R.; and Conarty, Thomas J., Jr., to Bethlehem Steel Corp. Method for increasing the wet bulk density of coking coals. 4,450,046, Cl. 201-20.000.
Richards, Nolan E.: *See*—
Johnston, Thomas J.; Richards, Nolan E.; and Tabereaux, Alton T., 4,450,063, Cl. 204-400.000.
Richards, Ronald L.: *See*—
Zychowski, Edwin A.; and Richards, Ronald L., 4,450,251, Cl. 524-251.000.
Richardson, Donald R.: *See*—
Montgomery, John R., IV; and Richardson, Donald R., 4,449,833, Cl. 368-262.000.
Richert, Manfred: *See*—
Knabel, Walter; Wagner, Ludwig; and Richert, Manfred, 4,449,731, Cl. 280-632.000.
Richmond, Michael S.: *See*—
Pilat, John F.; Richmond, Michael S.; Wallach, Walter A., Jr.; and Schleimer, Stephen I., 4,450,522, Cl. 364-200.000.
Ricketts, Thomas E.; and Sass, Allan, to Occidental Oil Shale, Inc. Method for bulking full a retort. 4,449,753, Cl. 299-2.000.
Ricoh Company, Ltd.: *See*—
Ikesue, Masumi; and Yanagawa, Nobuyuki, 4,449,810, Cl. 355-3.0DD.
Kikuchi, Hideo; Ikeda, Sunao; Kakitani, Yohtaro; Hibi, Kunio; and Okuzawa, Tugio, 4,449,813, Cl. 355-14.00R.
Rihani, Jawdat: *See*—
Strobel, Russell A.; Rihani, Jawdat; and Lunquist, Richard E., 4,450,583, Cl. 455-86.000.
Rilett, John W. Gas powered motors. 4,449,372, Cl. 60-671.000.
Rimma, John: *See*—
Crockatt, William B.; and Rimma, John, 4,450,247, Cl. 523-518.000.
Rinderle, Heinz: *See*—
Bohme, Rolf; Rinderle, Heinz; and Sieber, Jurgen, 4,449,404, Cl. 73-295.000.
Rine, James C.: *See*—
Tloczynski, James J.; Ahola, Clifford J.; Rosenstein, Nicholas D.; and Rine, James C., 4,449,670, Cl. 241-35.000.
Tloczynski, James J.; Budzol, Melvin; Ahola, Clifford J.; and Rine, James C., 4,449,674, Cl. 241-245.000.
Riseberg, Leslie A.: *See*—
Proud, Joseph M.; Riseberg, Leslie A.; Byszewski, Wojciech W.; and Budinger, A. Bowman, 4,450,380, Cl. 313-485.000.
Ritzema, Lloyd G.: *See*—
Gzym, Larry P.; Ritzema, Lloyd G.; and Haadsma, David K., Jr., 4,449,337, Cl. 52-126.400.
Ritzer, Alan; and Lapidot, Heine, to General Electric Company. Catalyst for a process for producing silicones. 4,450,282, Cl. 556-472.000.
Robb, Michael F., to King Coal Furnace Corporation. Coal burning apparatus. 4,449,462, Cl. 110-288.000.
Robbins, Carl A.: *See*—
Smith, Harry D., Jr.; and Robbins, Carl A., 4,450,354, Cl. 250-256.000.
Robert Bosch GmbH: *See*—
Brill, Klaus; and Grothe, Wolfgang, 4,450,201, Cl. 428-336.000.
Frister, Manfred; and Fakler, Bernhard, 4,450,389, Cl. 318-140.000.
Glockler, Otto; Gunther, Dieter; Horbelt, Michael; and Steinbrenner, Ulrich, 4,449,508, Cl. 123-492.000.
Hones, Helmut; and Mohaupt, Hubert, 4,449,598, Cl. 180-6.500.
Kemmner, Ulrich, 4,449,891, Cl. 417-423.00R.
Lauterbach, Heinz, 4,449,397, Cl. 73-118.000.
Robertshaw Controls Company: *See*—
Frankenberg, Alfred A.; and Scott, Douglas R., 4,449,362, Cl. 60-274.000.
Gunter, James C., 4,449,294, Cl. 29-792.000.
Robertson Factories, Inc.: *See*—
Alexander, Alfred, Jr., 4,449,295, Cl. 29-798.000.
Robins, Thomas S. Means for causing a suspensible picture frame. 4,449,688, Cl. 248-498.000.
Robinson, Frank D., to Robinson Helicopter Company. Apparatus for bonding main rotor blades. 4,449,703, Cl. 269-71.000.
Robinson Helicopter Company: *See*—
Robinson, Frank D., 4,449,703, Cl. 269-71.000.
Robinson, Horace M.: *See*—
Peterson, Daniel G.; Erickson, John W.; and Robinson, Horace M., 4,449,582, Cl. 166-64.000.
Robison, Luann, executrix: *See*—
Robison, William G., deceased; and Robison, Luann, executrix, 4,449,725, Cl. 280-78.000.
Robison, William G., deceased; and by Robison, Luann, executrix. Support for booms and other field equipment. 4,449,725, Cl. 280-78.000.
Rochlitzer, Frank: *See*—
Pross, Gerhard; and Rochlitzer, Frank, 4,449,537, Cl. 128-723.000.
Rockwell International Corporation: *See*—
Chin, Raymond, 4,450,463, Cl. 357-30.000.
Folkmann, Andrew F., 4,450,417, Cl. 333-24.00R.
Painter, Walter C.; Luttmer, David J.; and Galloway, Alvin J., 4,450,397, Cl. 318-762.000.
Spence, John R., 4,450,368, Cl. 307-362.000.
Rodenberger, Charles M.; Sizer, Phillip S.; and O'Malley, Kevin C., to Otis Engineering Corporation. Surface controlled subsurface safety valves. 4,449,587, Cl. 166-323.000.
Roder, Eberhard, deceased; by Borchers, Hans-Dieter, administrator; and Dusing, Wolfgang, to Gottfried Roder Kunststoffwerk. Tubular metering or dosing mechanism for dispensing liquid from a container in successive quantums of uniform volume. 4,449,651, Cl. 222-455.000.
Rogers, Gerald: *See*—
Solimeno, Duane; Brown, Sammy K.; Koeppen, Peter L.; and Rogers, Gerald, 4,450,534, Cl. 364-900.000.
Roggekamp, Aloysius G.: *See*—
Wolters, Tjako A.; and Roggekamp, Aloysius G., 4,449,720, Cl. 277-207.00A.
Roggero, Arnaldo; Bruzzone, Mario; and Gandini, Alberto, to Enoxy Chimica, S.p.A. Multifunctional anionic initiators and their use. 4,450,259, Cl. 526-173.000.
Rohrich, Manfred; and Brinkhaus, Stefan, to Becker Autoradiowerk GmbH. Tuning system for a high frequency receiver utilizing a controllable inductor. 4,450,588, Cl. 455-192.000.
Rolf, Richard L., to Aluminum Company of America. Metal stub and ceramic body electrode assembly. 4,450,061, Cl. 204-286.000.
Rooney, Floyd H. Solar collector building truss. 4,449,347, Cl. 52-639.000.
Rooney, John J.: *See*—
Adair, Noel J.; Carlisle, Robert W.; Stubbs, Michael E.; and Rooney, John J., 4,450,245, Cl. 502-211.000.
Roos, Bertil. Skid control car. 4,449,727, Cl. 280-91.000.
Rosa, Roger A.: *See*—
Forestier, Alexandre; Pluquet, Alain A.; Rosa, Roger A.; Tabet, Mansour; and Teysseyre, Pierre M., 4,449,607, Cl. 181-213.000.
Rosenberg, Harry: *See*—
Terhorst, Gunter; Plester, Karl-Heinz; Rosenberg, Harry; and Eggenstein, Friedrich, 4,449,859, Cl. 405-291.000.
Rosengreen, Arne: *See*—
Murray, Edward R.; van der Laan, Jan E.; Rosengreen, Arne; and Byer, Robert L., 4,450,356, Cl. 250-339.000.
Rosenstein, Nicholas D.: *See*—
Tloczynski, James J.; Ahola, Clifford J.; Rosenstein, Nicholas D.; and Rine, James C., 4,449,670, Cl. 241-35.000.
Roskam, Klaas: *See*—
Ettema, Ernst; Benraad, Coenraad J. B. M.; and Roskam, Klaas, 4,450,132, Cl. 264-328.800.
Ross, Dieter; and Ostertag, Klaus, to Erwin Sick GmbH Optik-Elektronik. Fault detection apparatus for material webs. 4,450,359, Cl. 250-572.000.
Roth, Oskar, to Involvo AG. Packing machine with adjustable means for weakening selected portions of cardboard blanks or the like. 4,449,349, Cl. 53-66.000.
Rothman, Irwin L., to Loral Corporation. Method of making a multiple layer coil winding system. 4,449,291, Cl. 29-605.000.
Rothwarf, Frederick: *See*—
Tauber, Arthur; Finnegan, Robert D.; and Rothwarf, Frederick, 4,449,952, Cl. 445-55.000.
Roussel Uclaf: *See*—
Christidis, Yani; and Fournex, Robert, 4,450.292, Cl. 562-463.000.
Clemence, Francois; Hunt, Peter F.; Le Martret, Odile; and Humbert, Daniel, 4,450,166, Cl. 424-258.000.
Le Martret, Odile; Humbert, Daniel; and Hunt, Peter F., 4,450,167, Cl. 424-258.000.
Nezot, Francois; Girault, Pierre; Tessier, Jean; and Martel, Jacques, 4,450,169, Cl. 424-270.000.
Roy, Kleber: *See*—
Buzzichelli, Lilian; and Roy, Kleber, 4,449,634, Cl. 212-196.000.
Roza, Engel: *See*—
Meuleman, Lambertus J.; van de Grijp, Abram; and Roza, Engel, 4,450,564, Cl. 372-26.000.
Rudolph, Otto J.: *See*—
Ricciardi, Ronald J.; and Rudolph, Otto J., 4,449,597, Cl. 177-256.000.
Ruger, William B.; and Melcher, Roy L., to Sturm, Ruger & Company, Inc. Mechanism adaptable for single action revolvers. 4,449,312, Cl. 42-66.000.
Rump, Martin, to Teleflex Incorporated. Hydraulic control package for a marine steering system. 4,449,470, Cl. 114-150.000.
Rupp, Robert D.: *See*—
Hobart, Ralph J.; Rupp, Robert D.; and Mastro, Paul F., 4,449,694, Cl. 251-171.000.
Russell, Byron L.: *See*—
Arter, William L.; and Russell, Byron L., 4,450,015, Cl. 148-9.00R.
Russell, Steven P., to Vitalink Communications Corporation. Method and apparatus for improving the capacity of a satellite transponder by reuse of bandwidth. 4,450,582, Cl. 455-12.000.
Russell, Thomas D.; and Walker, Robert R., to Babcock & Wilcox Company, The. Coordinated control technique and arrangement for steam power generating system. 4,450,363, Cl. 290-40.00C.
S & A Oil Field Services, Inc.: *See*—
Horn, Spencer C.; and Mogg, Alan A., 4,449,849, Cl. 405-52.000.
S.N.E.C.M.A.: *See*—
Forestier, Alexandre; Pluquet, Alain A.; Rosa, Roger A.; Tabet, Mansour; and Teysseyre, Pierre M., 4,449,607, Cl. 181-213.000.
Sadler, Fred S.; Hettwer, Paul F.; Viet, Vu H.; and Acker, Clarence R., to McGraw-Edison Company. Electrical insulating system. 4,450,424, Cl. 336-94.000.
St. Regis Paper Company: *See*—
Flannigan, Jerry E., 4,449,649, Cl. 222-181.000.

Saito, Chuichi; Teranishi, Katsuya; Baba, Katsuyoshi; and Osumi, Yoshihiro, to Hitachi, Ltd. Passenger conveyor balustrade. 4,449,623, Cl. 198-335.000.

Saito, Hideo: *See*—
Sato, Hideo; Goto, Yasuyuki; Saito, Hideo; Sawada, Shinichi; Matsunami, Keiichi; and Hirata, Kohzo, 4,450,094, Cl. 252-299.610.

Saito, Hidetoshi: *See*—
Kawatei, Hisatsugu; Saito, Hidetoshi; and Nakamura, Hisashi, 4,449,500, Cl. 123-380.000.

Saito, Hiroyuki: *See*—
Fujii, Yasuhiko; Kikuchi, Mitsuru; and Saito, Hiroyuki, 4,450,490, Cl. 360-13.000.

Saito, Hisatoshi; Fujii, Shuzo; Takase, Itaru; Nakamura, Akihiko; and Hara, Yoshihiro, to Q.P. Corporation; and Denka Engineering Kabushiki Kaisha. System for transporting plastics articles. 4,449,861, Cl. 406-39.000.

Saito, Koji, to Kyoto Ceramic Co., Ltd. Tool for making separated tooth model. 4,449,931, Cl. 433-74.000.

Saito, Toshihiko: *See*—
Sakamoto, Moriyoshi; and Saito, Toshihiko, 4,449,484, Cl. 122-13.00R.

Saka, Hiroshi; and Tanaka, Toshihide, to Matsushita Electric Industrial Co., Ltd. Microwave integrated circuit mixer. 4,450,584, Cl. 455-325.000.

Sakaguchi, Katsuyoshi: *See*—
Hasegawa, Akira; and Sakaguchi, Katsuyoshi, 4,449,903, Cl. 425-38.000.

Sakakiyama, Ryuzo; and Takano, Toshio, to Fuji Jukogyo Kabushiki Kaisha. Electro-magnetic clutch control system for automobiles. 4,449,617, Cl. 192-0.033.

Sakakiyama, Ryuzo, to Fuji Jukogyo Kabushiki Kaisha. System for controlling an electromagnetic clutch for automobiles. 4,449,619, Cl. 192-0.052.

Sakakiyama, Ryuzo, to Fuji Jukogyo Kabushiki Kaisha. Electromagnetic clutch control system for vehicles. 4,449,620, Cl. 192-0.052.

Sakamoto, Masahiro: *See*—
Egawa, Setsuya; and Sakamoto, Masahiro, 4,450,123, Cl. 264-4.700.

Sakamoto, Moriyoshi; and Saito, Toshihiko, to Tokyo Shibaura Denki Kabushiki Kaisha. Hot water supply system. 4,449,484, Cl. 122-13.00R.

Sakoda, Yasuhiro; and Matsubayashi, Kazuyuki, to Sharp Kabushiki Kaisha. Damper drive system in a combined microwave and electric heater oven. 4,450,344, Cl. 219-400.000.

Sakurada, Nobuaki; Kawamura, Masaharu; Ohtaki, Shohei; Nakamoto, Soichi; and Shinoda, Nobuhiko, to Canon Kabushiki Kaisha. Data registration device. 4,449,805, Cl. 354-105.000.

Sakurada, Shuroku: *See*—
Nagano, Takahiro; Sanpei, Isamu; Sakurada, Shuroku; and Nakagawa, Masaru, 4,450,467, Cl. 357-38.000.

Sakuta, Koichi: *See*—
Tani, Tatsuo; Sawata, Sinji; Tanaka, Tadayoshi; Sakuta, Koichi; Nakamoto, Yasunobu; Sekiya, Hideshi; Morita, Masanobu; and Yamagata, Norio, 4,449,517, Cl. 126-435.000.

Salam, Hassan P. A., to Unisplay, S.A. Plaque remover. 4,449,934, Cl. 433-143.000.

Salama, Clement A.: *See*—
Malhi, Satwinder D.; and Salama, Clement A., 4,450,366, Cl. 307-297.000.

Saleck, Wilhelm: *See*—
Weyde, Edith; von Rintelen, Harald; Saleck, Wilhelm; and Teitscheid, Heinz-Horst, 4,450,225, Cl. 430-567.000.

Salit, Yechiel. Kit for the assembly of electrical circuits. 4,449,942, Cl. 434-224.000.

Salmon, Jean P.; and Theze, Claude P., to Jeumont Schneider Corporation. Coupling for inducing a current in the rails of a railroad track. 4,449,685, Cl. 246-8.000.

Salvucci, Orfeo J.; Hobby, John M.; Hennessy, James J.; and Young, Ronald R., to Harris Graphics Corporation. Web splicing apparatus. 4,450,039, Cl. 156-504.000.

Samietz, Klaus: *See*—
Weingartner, Ernst; and Samietz, Klaus, 4,450,570, Cl. 373-69.000.

Sanderson, John R.; Watts, Lewis W., Jr.; and Brader, Walter H., Jr., to Texaco Inc. Alkane acetates produced by oxidative esterification of olefins over transition metal borates in the presence of acetic acid. 4,450,290, Cl. 560-246.000.

Sandoz Ltd.: *See*—
Fischer, Rudolf; Kunzle, Franz M.; and Schmutz, Jean, 4,450,108, Cl. 260-243.300.

Sanford, Karl J.; Sutherland, John W.; and Eikenberry, Jon N., to Eastman Kodak Company. Incorporation of pyridoxal phosphate in dry analytical elements for the determination of enzymes. 4,450,232, Cl. 435-15.000.

Sanford, Redmond. Method and apparatus for making sealed packages for spreadable products. 4,449,350, Cl. 53-412.000.

Sankyo Company, Limited: *See*—
Kamioka, Toshiharu; Nakayama, Isao; Honda, Takeo; Kobayashi, Takashi; Obata, Tokio; Fujii, Katsutoshi; Kojima, Mikio; and Akiyoshi, Yuji, 4,450,162, Cl. 424-251.000.

Sano, Makoto: *See*—
Yamada, Takeyoshi; Kurisu, Shizuka; Azuma, Shizuo; Kawase, Shoji; and Sano, Makoto, 4,449,992, Cl. 55-158.000.

Sanpei, Isamu: *See*—
Nagano, Takahiro; Sanpei, Isamu; Sakurada, Shuroku; and Nakagawa, Masaru, 4,450,467, Cl. 357-38.000.

Santrade Ltd.: *See*—
Stabler, Gerhard; and Schermutzki, Konrad, 4,449,448, Cl. 100-153.000.
Vesterlund, Gunnar; and Anderson, Erik T., 4,450,016, Cl. 148-11.50F.
Vesterlund, Gunnar, 4,450,020, Cl. 148-11.50F.

Sanyo Electric Co., Ltd.: *See*—
Kudo, Toshiyuki; Itoh, Kazuo; and Kitamura, Masafumi, 4,450,551, Cl. 369-173.000.
Tanaka, Masaru, 4,450,399, Cl. 318-814.000.

Sarapulov, Jury M.: *See*—
Nikomarov, Samuil S.; Kochnev, Anatoly M.; Goldobin, Vladimir B.; Sarapulov, Jury M.; and Valdman, Isaak Y., 4,449,953, Cl. 464-19.000.

Sardelis, Timothy: *See*—
Bendel, Lee P.; and Sardelis, Timothy, 4,449,530, Cl. 128-325.000.

Sarin, Vinod K.; and Buljan, Sergej-Tomislav, to GTE Laboratories Incorporated. Coated silicon nitride cutting tools. 4,449,989, Cl. 51-295.000.

Sarrine, Robert J., to Transidyne General Corporation. Endoscope. 4,449,519, Cl. 128-4.000.

Sarstedt, Walter, to Walter Sarstedt Kunstoff-Spritzgusswerk. Blood extraction device. 4,449,539, Cl. 128-764.000.

Sasaki, Masao, to Oki Electric Industry Co., Ltd. Carrier moving mechanism. 4,449,417, Cl. 74-409.000.

Sasaki, Tomiya: *See*—
Miyazaki, Yoshiro; Yasunaga, Toshio; and Sasaki, Tomiya, 4,449,579, Cl. 165-104.330.

Sass, Allan: *See*—
Ricketts, Thomas E.; and Sass, Allan, 4,449,753, Cl. 299-2.000.

Satake Engineering Co., Ltd.: *See*—
Satake, Toshihiko, 4,450,181, Cl. 426-507.000.

Satake, Toshihiko, to Satake Engineering Co., Ltd. Method of humidifying polished rice. 4,450,181, Cl. 426-507.000.

Sathe, Avinash T., to PPG Industries, Inc. Method for purifying N-benzyloxycarbonyl aspartic acid. 4,450,284, Cl. 560-163.000.

Sato, Hideki; and Asahina, Hiroshi, to Tokyo Shibaura Denki Kabushiki Kaisha. X-Ray apparatus. 4,450,577, Cl. 378-109.000.

Sato, Hideo; Goto, Yasuyuki; Saito, Hideo; Sawada, Shinichi; Matsunami, Keiichi; and Hirata, Kohzo, to Chisso Corporation. Nematic liquid crystal compositions for display apparatuses. 4,450,094, Cl. 252-299.610.

Sato, Hideo: *See*—
Horie, Seiji; Nakano, Junji; and Sato, Hideo, 4,450,219, Cl. 430-59.000.

Sato, Hideyori; and Arai, Mitsuru, to Kabushiki Kaisha Komatsu Seisakusho. Hydraulic control system for off-highway self-propelled work machines. 4,449,366, Cl. 60-444.000.

Sato, Norihide: *See*—
Okamura, Yasushi; Manabe, Harukazu; and Sato, Norihide, 4,449,838, Cl. 400-234.000.

Sato, Susumu: *See*—
Eto, Hiromichi; Kohmoto, Teruo; Kouda, Tadayuki; Ogawa, Youichiro; Sato, Susumu; Kuraishi, Tadayuki; and Nakashima, Toshiaki, 4,450,109, Cl. 260-243.300.

Sato, Yasushi: *See*—
Kitamura, Takashi; Watanabe, Asao; Nakano, Takashi; Masaki, Katsumi; Hirayama, Kazuhiro; Sato, Yasushi; and Tokiwa, Taisuke, 4,450,453, Cl. 346-108.000.

Satou, Kazuo; and Yoritaka, Masashi, to Toyo Kogyo Co., Ltd. Ductile cast iron. 4,450,019, Cl. 148-35.000.

Satya, Akella V. S.: *See*—
Bond, George L.; and Satya, Akella V. S., 4,450,559, Cl. 371-10.000.

Saucier, Howard J. Crayfish, harvesting, sheltering and spacing apparatus. 4,449,479, Cl. 119-2.000.

Sauer, Heinz; Stichel, Willi; and Wachter, Gerhard, to Rasmussen GmbH. Power tool for tensioning hose clamps and the like. 4,449,429, Cl. 81-9.300.

Sauerwein, William D.; Sides, Daniel H.; Weber, Steven A.; and Horney, James R., to Black & Decker Inc. Composite washer assembly. 4,449,329, Cl. 51-168.000.

Saumer, Wilhelm: *See*—
Schmidts, Kurt; Schuett, Walter; Zeysolff, Edmond; and Saumer, Wilhelm, 4,449,914, Cl. 425-556.000.

Saunders, Hollis S.; Carmer, Richard V.; and Payette, Lionel J., to Essex Group, Inc. Power insertable nylon coated magnet wire. 4,449,290, Cl. 29-596.000.

Sawada, Shinichi: *See*—
Sato, Hideo; Goto, Yasuyuki; Saito, Hideo; Sawada, Shinichi; Matsunami, Keiichi; and Hirata, Kohzo, 4,450,094, Cl. 252-299.610.

Sawata, Sinji: *See*—
Tani, Tatsuo; Sawata, Sinji; Tanaka, Tadayoshi; Sakuta, Koichi; Nakamoto, Yasunobu; Sekiya, Hideshi; Morita, Masanobu; and Yamagata, Norio, 4,449,517, Cl. 126-435.000.

Sawatzki, Harry, to Censor Patent- Und Versuchs-Anstalt. Metering pump especially for volatile materials. 4,449,650, Cl. 222-309.000.

Sawka, Steven; Moretti, Vincent; and Heal, Sam F., to United States of America, Army. D.C. Lamp burn-out protection. 4,450,382, Cl. 315-082.000.

Scales, John M.; and Wolcott, Bernard F., to Nicolon Corporation. Revetment panel. 4,449,847, Cl. 405-19.000.

Scanlon, Walter: *See*—
Hild, Herbert A.; and Scanlon, Walter, 4,449,467, Cl. 114-103.000.

Scardina, Annette, executrix: *See—*
Scardina, Virgil R., deceased; and Scardina, Annette, executrix, 4,450,318, Cl. 174-84.00R.

Scardina, Virgil R., deceased; and by Scardina, Annette, executrix, to Siemens-Allis, Inc. Means and method for providing insulation splice. 4,450,318, Cl. 174-84.00R.

Schael, Fritz: *See—*
Fiala, Ernst; Schael, Fritz; and Schoedder, Reiner, 4,449,748, Cl. 296-183.000.

Schafer, Wolfgang: *See—*
Eiermann, Kurt; Horlebein, Eberhard; Lissmann, Kurt; and Schafer, Wolfgang, 4,449,402, Cl. 73-204.000.

Schar, Hugo. Athletic footwear for bicyclists. 4,449,308, Cl. 36-131.000.

Scharf, Emil: *See—*
Hertel, Otto; Linhart, Friedrich; and Scharf, Emil, 4,450,045, Cl. 162-164.300.

Scheie, Carl E.: *See—*
Benedyk, Joseph C.; Amos, Homer C.; Scheie, Carl E.; and McGlone, William R., 4,449,712, Cl. 273-326.000.

Schempp, Heinrich: *See—*
Sturm, Elmar; Schempp, Heinrich; and Martin, Henry, 4,449,999, Cl. 71-73.000.

Schering Aktiengesellschaft: *See—*
Nickisch, Klaus; Laurent, Henry; Wiechert, Rudolf; and Casals-Stenzel, Jorge, 4,450,107, Cl. 424-238.000.

Schering Corporation: *See—*
Bristol, James A.; and Puchalski, Chester, 4,450,164, Cl. 424-256.000.

Schermutzki, Konrad: *See—*
Stabler, Gerhard; and Schermutzki, Konrad, 4,449,448, Cl. 100-153.000.

Schiedermayer, Marvin L.: *See—*
Corrigall, Don J.; and Schiedermayer, Marvin L., 4,450,340, Cl. 219-132.000.

Schilling, Peter; and Schreuders, Hans G., to Westvaco Corporation. Cationic bituminous emulsions. 4,450,011, Cl. 106-269.000.

Schinke, Franz, to U.S. Philips Corporation. Cleaning device for the intermediate image carrier of an electrophoretic printer. 4,449,475, Cl. 118-645.000.

Schirk, Gunter: *See—*
Geyken, Erwin; Koninger, Horst; and Schirk, Gunter, 4,449,278, Cl. 29-132.000.

Schleimer, Stephen I.: *See—*
Pilat, John F.; Richmond, Michael S.; Wallach, Walter A., Jr.; and Schleimer, Stephen I., 4,450,522, Cl. 364-200.000.

Schleussner, Hans: *See—*
Walker, Wolfram H.; Ganshirt, Karl H.; and Schleussner, Hans, 4,450,078, Cl. 210-315.000.

Schluter, Harry C. Mailbox signal device. 4,449,663, Cl. 232-35.000.

Schmidt, Charles J.: *See—*
Albanese, Victor J.; and Schmidt, Charles J., 4,450,448, Cl. 343-379.000.

Schmidt, Manfred; Wank, Joachim; Reese, Eckart; Freitag, Dieter; Wangermann, Klaus; and Cohnen, Wolfgang, to Bayer Aktiengesellschaft. Internal antistatic agents for polycarbonates and for polycarbonate films. 4,450,249, Cl. 524-132.000.

Schmidt, William P.: *See—*
Hegarty, William P.; and Schmidt, William P., 4,449,994, Cl. 62-17.000.

Schmidtpott, Friedrich; and Backes, Reiner, to ITT Industries, Inc. Binary MOS parallel comparators. 4,450,432, Cl. 340-146.200.

Schmidts, Kurt; Schuett, Walter; Zeysolff, Edmond; and Saumer, Wilhelm, to BASF Aktiengesellschaft. Injection mold with demolding device. 4,449,914, Cl. 425-556.000.

Schmolka, Irving R., to BASF Wyandotte Corporation. High foaming liquid shampoo composition. 4,450,091, Cl. 252-174.210.

Schmuckal, Robin R.: *See—*
Reed, Ronald G.; Schmuckal, Robin R.; and McCullough, Robert K., 4,450,387, Cl. 315-375.000.

Schmutz, Jean: *See—*
Fischer, Rudolf; Kunzle, Franz M.; and Schmutz, Jean, 4,450,108, Cl. 260-243.300.

Schnuell, Henry A., to E. R. Wagner Mfg. Co. Caster wheel brake having an overcenter latch. 4,449,268, Cl. 16-35.00R.

Schoedder, Reiner: *See—*
Fiala, Ernst; Schael, Fritz; and Schoedder, Reiner, 4,449,748, Cl. 296-183.000.

Schorfheide, James J.: *See—*
Branson, Judeth H.; and Schorfheide, James J., 4,449,991, Cl. 55-73.000.

Schreuders, Hans G.: *See—*
Schilling, Peter; and Schreuders, Hans G., 4,450,011, Cl. 106-269.000.

Schroder, William J.: *See—*
Moore, James R.; Schroder, William J.; Warner, Charles E.; and Pittman, Edgar H., 4,449,355, Cl. 57-284.000.

Schroeder, Charles M., Jr.: *See—*
Andrejco, Matthew J.; Paek, Un C.; and Schroeder, Charles M., Jr., 4,450,333, Cl. 219-10.49R.

Schroeder, Jon M., to Schroeder, Jon M. Apparatus for encapsulation casting. 4,449,690, Cl. 249-85.000.

Schroeder, Joseph W., to Foster Wheeler Energy Corporation. Explosive tube expansion. 4,449,280, Cl. 29-421.00E.

Schroeder, Terry A.: *See—*
Haque, Sazzadul; and Schroeder, Terry A., 4,449,864, Cl. 407-113.000.

Schroeder, Warren E. Optical composing stage. 4,450,536, Cl. 355-75.000.

Schuermeyer, Fritz L. Dynamic MESFET logic with voltage level shift circuit. 4,450,369, Cl. 307-450.000.

Schuett, Walter: *See—*
Schmidts, Kurt; Schuett, Walter; Zeysolff, Edmond; and Saumer, Wilhelm, 4,449,914, Cl. 425-556.000.

Schultz, Dennis: *See—*
Berecz, Imre; Schultz, Dennis; and Daniel, Leroy O., 4,449,283, Cl. 29-566.100.

Schultz, Walter C.: *See—*
Sullivan, Edward F.; Sullivan, Patrick; and Schultz, Walter C., 4,449,553, Cl. 138-35.000.

Schulz Marine Systems, Inc.: *See—*
Schulz, Walter A.; and Procter, John H., 4,449,468, Cl. 114-104.000.

Schulz, Walter A.; and Procter, John H., to Schulz Marine Systems, Inc. Adjustable roller furling spar. 4,449,468, Cl. 114-104.000.

Schulz, William J., to Appleton Papers Inc. Method for recovering pulp from pressure-sensitive carbonless copying paper waste. 4,450,043, Cl. 162-5.000.

Schwartz, Arnold, to Perkin-Elmer Corporation, The. Control circuit for liquid chromatograph. 4,450,574, Cl. 377-2.000.

Schwartz, Vern R., to AMFIT, Inc. System for forming custom-made shoe inserts. 4,449,264, Cl. 12-1.00R.

Schwarzmann, Alfred, to RCA Corporation. Monolithic reflection phase shifter. 4,450,419, Cl. 333-164.000.

Schweizer, Russell J., to Kendall Company, The. Drainage receptacle with support frame. 4,449,969, Cl. 604-322.000.

Schwiesow, Ronald L., to United States of America, Commerce. Device for measurement of the spectral width of nearly monochromatic sources of radiant energy. 4,449,823, Cl. 356-346.000.

Scifres, Donald R.; Streifer, William; and Burnham, Robert D., to Xerox Corporation. Optical repeater integrated lasers. 4,450,567, Cl. 372-50.000.

Scitech Corporation: *See—*
De La Cierva, Juan, 4,450,480, Cl. 358-149.000.

Scott, Douglas R.: *See—*
Frankenberg, Alfred A.; and Scott, Douglas R., 4,449,362, Cl. 60-274.000.

Seagram Distillers Limited: *See—*
Snedker, Robert, 4,449,637, Cl. 215-21.000.

Sealed Power Corporation: *See—*
Anderson, David L.; Hitchcock, Robert F.; and Tamburrino, Robert M., 4,450,081, Cl. 210-445.000.

Sebastian, Richard: *See—*
Kenyon, Stephen C.; Simkins, Laura J.; Brown, Leroy L.; and Sebastian, Richard, 4,450,531, Cl. 364-604.000.

Seige Corporation: *See—*
Nilsson, Jack E., Sr., 4,449,515, Cl. 126-430.000.

Seiko Instruments & Electronics Ltd.: *See—*
Shimbo, Masafumi, 4,449,284, Cl. 29-571.000.

Sekiya, Hideshi: *See—*
Tani, Tatsuo; Sawata, Sinji; Tanaka, Tadayoshi; Sakuta, Koichi; Nakamoto, Yasunobu; Sekiya, Hideshi; Morita, Masanobu; and Yamagata, Norio, 4,449,517, Cl. 126-435.000.

Seko, Yasutoshi; Yanagishima, Takayuki; and Fukasawa, Noburu, to Nissan Motor Company, Limited. Drowsiness alarm system for a vehicle. 4,450,438, Cl. 340-576.000.

Selas Corporation of America: *See—*
Spahr, Richard F., 4,449,918, Cl. 431-76.000.

Selcuk, M. Kudret, to United States of America, National Aeronautics and Space Administration. Solar concentrator protective system. 4,449,514, Cl. 126-418.000.

Select Laboratories, Inc.: *See—*
Peterson, Walter L., 4,449,968, Cl. 604-24.000.

Selenia, Industrie Elettroniche Associate, S.p.A.: *See—*
Marchetti, Renato; Penco, Eugenio; and Perito, Ugo, 4,450,566, Cl. 372-38.000.

Semerjian, Joseph K.; and Lodge, Glenn R., to Wilson Jones Company. Sheet punch device. 4,449,436, Cl. 83-571.000.

Separex Teknik AB: *See—*
Westberg, J. Eric H.; and Unger, H. Peter O., 4,449,964, Cl. 494-16.000.

Setsune, Jun-ichiro: *See—*
Kitao, Teijiro; Setsune, Jun-ichiro; Ishihara, Shoichi; and Yamamoto, Ryoichi, 4,449,516, Cl. 126-430.000.

Severson, Asbjorn M., to Honeywell Inc. Meter tampering indicator. 4,450,504, Cl. 361-369.000.

Shacket, Sheldon; and Helfman, Robert, to Trus-Us, Inc. Dormer structure and method. 4,449,334, Cl. 52-79.300.

Sharp Kabushiki Kaisha: *See—*
Ikemoto, Yutaka; and Tanimoto, Akira, 4,449,829, Cl. 368-63.000.
Nakatani, Hiroshi; and Yamamoto, Hachizou, 4,450,526, Cl. 364-405.000.
Sakoda, Yasuhiro; and Matsubayashi, Kazuyuki, 4,450,344, Cl. 219-400.000.

Shaw, Montgomery T.: *See—*
Kurtz, Stuart J.; De Rossett, Terry A.; and Shaw, Montgomery T., 4,449,395, Cl. 73-56.000.

Shay, Robert H.: *See—*
Berger, Kerry R.; Kaspersma, Jelle H.; Luybli, Joseph R.; Millward, Barry; and Shay, Robert H., 4,450,017, Cl. 148-16.000.

Shell Oil Company: *See—*
Lewis, Robert M.; and Slaugh, Lynn H., 4,450,099, Cl. 502-232.000.
Muszynski, Larry C., 4,449,852, Cl. 405-168.000.

Paxson, Timm E., 4,450,286, Cl. 560-241.000.
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Paxson, Timm E., 4,450,288, Cl. 560-241.000.
Paxson, Timm E., 4,450,289, Cl. 560-241.000.
Versluis, Jan; deGroot, Johan; and van Baalen, Anton, 4,449,946, Cl. 441-4.000.

Shelley Manufacturing Company Division of Allo Food Service Equipment Company: *See*—
House, Bruce F., 4,449,760, Cl. 312-42.000.

Shelton, Kent: *See*—
Gillette, Robert H.; Brammall, Terrence N.; Shelton, Kent; and Cramer, Chris, 4,449,328, Cl. 51-73.00R.

Shenkman, Mitchell B.: *See*—
Thorpe, Kenneth J., 4,449,378, Cl. 62-371.000.

Shepherd, Robert G.: *See*—
Du, Mila T.; and Shepherd, Robert G., 4,450,272, Cl. 544-357.000.

Sherman, Earle C.: *See*—
Johnson, Harold D.; Sherman, Earle C.; and Cooper, Leonard M., 4,449,633, Cl. 206-612.000.

Shiba, Hiroshi, to Nippon Electric Co., Ltd. Semiconductor integrated circuit device. 4,450,470, Cl. 357-59.000.

Shibakawa, Riichiro: *See*—
Celmer, Walter D.; Cullen, Walter P.; Shibakawa, Riichiro; and Tone, Junsuke, 4,450,237, Cl. 435-253.000.

Shibata, Susumu: *See*—
Ishii, Masami; Sugimoto, Hitoshi; Takeda, Shinji; and Shibata, Susumu, 4,450,038, Cl. 156-497.000.

Shibukawa, Mitsuru: *See*—
Mimura, Akio; Yuasa, Katsumi; and Shibukawa, Mitsuru, 4,450,233, Cl. 435-178.000.

Shibuya, Kunihiro; and Uchida, Kohachi, to Tokyo Shibaura Denki Kabushiki Kaisha. Paper feed device. 4,449,705, Cl. 271-9.000.

Shih, Stuart S.: *See*—
Angevine, Philip J.; Carroll, Michael B.; Shih, Stuart S.; and Tabak, Samuel A., 4,450,067, Cl. 208-86.000.

Shikatani, Yutaka: *See*—
Matsuura, Kazuo; Kuroda, Nobuyuki; Shiraishi, Takeichi; Shikatani, Yutaka; and Miyoshi, Mituji, 4,450,243, Cl. 502-131.000.

Shimba, Satoru; Ito, Kenji; Tsuda, Yasuo; and Sugita, Hiroshi, to Konishiroku Photo Industry Co., Ltd. Light-sensitive silver halide color photographic material. 4,450,228, Cl. 430-505.000.

Shimbo, Masafumi, to Seiko Instruments & Electronics Ltd. Method of manufacturing an integrated circuit device having vertical field effect transistors. 4,449,284, Cl. 29-571.000.

Shimizu, Isamu; Ogawa, Kyosuke; and Inoue, Eiichi, to Canon Kabushiki Kaisha. Process for forming amorphous silicon film. 4,450,185, Cl. 427-39.000.

Shimizu, Toshiki; and Inoue, Kazuyuki, to Matsushita Electric Industrial Co., Ltd. Door opening apparatus for heating appliance. 4,450,335, Cl. 219-10.55C.

Shimosato, Yoshikazu, to Chugai Ro Kogyo Co., Ltd. Continuous heat-treating furnace. 4,449,923, Cl. 432-82.000.

Shin-Etsu Polymer Co., Ltd.: *See*—
Takashi, Nogami; and Masayuki, Mitsuhashi, 4,449,774, Cl. 339-59.00M.

Shinagawa, Kiminari: *See*—
Fujiwara, Hideo; Kudo, Mitsuhiro; Tamura, Teizo; Sugishita, Nobuyuki; Shiroishi, Yoshihiro; Kimura, Takeshi; Shinagawa, Kiminari; and Kumasaka, Noriyuki, 4,450,494, Cl. 360-125.000.

Shinoda, Nobuhiko: *See*—
Sakurada, Nobuaki; Kawamura, Masaharu; Ohtaki, Shohei; Nakamoto, Soichi; and Shinoda, Nobuhiko, 4,449,805, Cl. 354-105.000.

Shinohara, Koichi, to Matsushita Electric Industrial Co., Ltd. Method and device for manufacturing magnetic recording medium. 4,450,186, Cl. 427-42.000.

Shinozawa, Takahiro, to Toyo Aerosol Industry Co., Ltd. Powder aerosol composition. 4,450,151, Cl. 424-46.000.

Shipley, George H.: *See*—
Castleman, B. Wayne; Donehoo, Robert F.; Oswald, Rudolph G.; Reed, Kenneth L.; and Shipley, George H., 4,450,409, Cl. 324-460.000.

Shiraishi, Takeichi: *See*—
Matsuura, Kazuo; Kuroda, Nobuyuki; Shiraishi, Takeichi; Shikatani, Yutaka; and Miyoshi, Mituji, 4,450,243, Cl. 502-131.000.

Shirasaka, Hisatoshi, to Tokyo Shibaura Denki Kabushiki Kaisha. Address accessed memory device having parallel to serial conversion. 4,450,538, Cl. 365-219.000.

Shiratsuchi, Kouji, to Honda Giken Kogyo Kabushiki Kaisha. Vehicle fuel tank. 4,449,723, Cl. 280-5.00H.

Shiroishi, Yoshihiro: *See*—
Fujiwara, Hideo; Kudo, Mitsuhiro; Tamura, Teizo; Sugishita, Nobuyuki; Shiroishi, Yoshihiro; Kimura, Takeshi; Shinagawa, Kiminari; and Kumasaka, Noriyuki, 4,450,494, Cl. 360-125.000.

Shirosaki, Tsutomu; and Fukunaga, Seiki, to Nippon, Kayaku, Kabushiki, Kaisha. Dialkylthioxanthones. 4,450,279, Cl. 549-27.000.

Shook, James G., to Kemp Furniture Industries, Inc. Drawer guide. 4,449,766, Cl. 312-348.000.

Shori, Kaoru, to Nissan Motor Company, Limited. Gearshift device. 4,449,418, Cl. 74-475.000.

Showa Aluminum Corporation: *See*—
Munekawa, Masaaki, 4,449,578, Cl. 165-104.330.

Sico Incorporated: *See*—
Wilson, Kermit H.; and Bue, Richard C., 4,449,263, Cl. 5-133.000.

Sides, Daniel H.: *See*—
Sauerwein, William D.; Sides, Daniel H.; Weber, Steven A.; and Horney, James R., 4,449,329, Cl. 51-168.000.

Sidman, Kenneth R., to Arthur D. Little, Inc. Biodegradable, implantable drug delivery depots, and method for preparing and using the same. 4,450,150, Cl. 424-1.100.

Sieber, Jurgen: *See*—
Bohme, Rolf; Rinderle, Heinz; and Sieber, Jurgen, 4,449,404, Cl. 73-295.000.

Siegal, Burton L., to KIWI Coders Corporation. Piezoelectric fluid control device. 4,450,375, Cl. 310-331.000.

Siegal, Burton L., to Coral Industrial Sales Co. Electrically grounded, static absorbing drapery installation. 4,450,498, Cl. 361-212.000.

Siemens AG: *See*—
Dreiseitl, Walter; Koch, Manfred; and Linden, Wilhelm, 4,450,403, Cl. 324-166.000.

Siemens Aktiengesellschaft: *See*—
Ackermann, Rudolf, 4,450,482, Cl. 358-160.000.
Oldham, William G., 4,450,537, Cl. 365-217.000.
Peruth, Gunther, 4,450,514, Cl. 363-37.000.
Putz, Wilhelm, 4,449,298, Cl. 30-90.100.
Witte, Hans H., 4,449,783, Cl. 350-96.160.
Zuckler, Karl, 4,450,330, Cl. 200-148.00A.

Siemens-Allis, Inc.: *See*—
Luke, Roger D.; and Rhodes, John M., 4,449,296, Cl. 29-883.000.
Scardina, Virgil R., deceased; and Scardina, Annette, executrix, 4,450,318, Cl. 174-84.00R.

Siemens Interatom, Intl. Atomreaktorbau GmbH: *See*—
Barzantny, Joachim; Beske, Joachim; Hans, Rainer; and Lauhoff, Theodor, 4,449,890, Cl. 417-50.000.

Siemens Medical Laboratories, Inc.: *See*—
Jahsman, Hendrick; and Menor, George, 4,449,262, Cl. 5-63.000.

Siemion, Edward D. Floor seal strip. 4,449,267, Cl. 15-257.00R.

Sienkiewicz, Boleslaw; Kramer, Franklin; Klein, Imrich; Oldershaw, C. G. Peter; and Chuang, Locus Y., to General Foods Corporation. Extrusion nozzle arrangement. 4,449,906, Cl. 425-131.100.

Siffert, Bernard: *See*—
Floreancig, Antoine; Siffert, Bernard; and Trescol, Jean-Jacques, 4,450,143, Cl. 423-10.000.

Simkins, Laura J.: *See*—
Kenyon, Stephen C.; Simkins, Laura J.; Brown, Leroy L.; and Sebastian, Richard, 4,450,531, Cl. 364-604.000.

Simmons, Ronald L.; and Young, Herbert L., to Hercules Incorporated. Azido nitramine. 4,450,110, Cl. 260-349.000.

Simmons U.S.A. Corp.: *See*—
Magnusson, Robert A., 4,449,261, Cl. 5-465.000.

Singh, Jag J., to United States of America, National Aeronautics and Space Administration. Radionuculide counting technique for measuring wind velocity and direction. 4,449,400, Cl. 73-189.000.

Singh, Rajindar: *See*—
Feigenbaum, Haim; Pudick, Sheldon; and Singh, Rajindar, 4,450,212, Cl. 429-35.000.

Siracusa, Denise: *See*—
McMullen, Warren H.; Chessin, Hyman; and Siracusa, Denise, 4,450,052, Cl. 204-51.000.

Sizer, Phillip S.: *See*—
Rodenberger, Charles M.; Sizer, Phillip S.; and O'Malley, Kevin C., 4,449,587, Cl. 166-323.000.

Sjolund, John R., to Sundstrand Corporation. Tilt detector with pyramidal surface. 4,450,353, Cl. 250-231.00R.

SKF Industrial Trading & Development Company B.V.: *See*—
Kapaan, Hendrikus J., 4,449,957, Cl. 474-14.000.

SKF Kugellagerfabriken GmbH: *See*—
Brandenstein, Manfred; and Hans, Rudiger, 4,449,841, Cl. 403-24.000.
Olschewski, Armin; Laszlofalvi, Zoltan; and Kunkel, Heinrich, 4,449,421, Cl. 74-516.000.

Slaugh, Lynn H.: *See*—
Lewis, Robert M.; and Slaugh, Lynn H., 4,450,099, Cl. 502-232.000.

Smid, Robert W.: *See*—
Steensma, Peter D.; Weinberg, Murray; Smid, Robert W.; and Finley, Thomas E., 4,450,554, Cl. 370-4.000.

Smith, Harry D., Jr.; and Robbins, Carl A., to Halliburton Company. Gain stabilized natural gamma ray detection of casing thickness in a borehole. 4,450,354, Cl. 250-256.000.

Smith, James R., to Curtis Screw Company, Inc. Cutoff device for automatic screw machine. 4,449,432, Cl. 82-3.000.

Smith Kline & French Laboratories Limited: *See*—
White, George R., 4,450,161, Cl. 424-251.000.

Smith, Robert J.: *See*—
Bussiere, Ronald L.; and Smith, Robert J., 4,450,139, Cl. 422-186.300.

Smith, Robert L.: *See*—
Hoffman, William F.; Smith, Robert L.; and Willard, Alvin K., 4,450,171, Cl. 424-279.000.

Smith, Somers H., III, to Black & Decker Inc. Fastener tool. 4,449,660, Cl. 227-8.000.

Smiths Industries Public Limited Company: *See*—
Coates, Terence J., 4,449,414, Cl. 73-861.370.

Smolinski, Ronald E., to Ecton Corp. Rotary vane machine. 4,449,899, Cl. 418-255.000.

Snedker, Robert, to Seagram Distillers Limited. Anti-tampering devices for bottles. 4,449,637, Cl. 215-21.000.

Snellman, Donald L.; and Pearson, Bernard A., to Snellman, Donald L. Drive system for a collator. 4,449,706, Cl. 271-290.000.

Snow, Robert A.: *See*—
Klein, Gerald W.; Snow, Robert A.; and Sutton, Richard C., 4,450,224, Cl. 430-213.000.
S.A. Martin: *See*—
Barny, Jean-Jacques; and Capdeboscq, Bernard, 4,449,450, Cl. 101-232.000.
Societe d'Assistance Technique pour Produits Nestle S.A.: *See*—
Philippossian, Georges, 4,450,163, Cl. 424-253.000.
Societe de Pariset du Rhone S.A.: *See*—
Disclaire, Jacques; and Mignotte, Claude, 4,449,288, Cl. 29-596.000.
Societe d'Utilisation Scientifique et Industrielle du Froid Usifroid: *See*—
Baron, Michel; and Larrat, Philippe, 4,449,305, Cl. 34-92.000.
Societe Francaise d'Electrometallurgie Sofrem: *See*—
Herold, Robert; and Dubrous, Francis, 4,450,003, Cl. 75-10.00R.
Societe les Piles Wonder: *See*—
Vignaud, Rene, 4,450,211, Cl. 429-27.000.
Soderberg, Roy E., to Crosby Valve & Gage Company. Blowdown valve. 4,449,544, Cl. 137-15.000.
Sofranko, John A.; and Leonard, John J., to Atlantic Richfield Company. Preparation of α-hydroxyisobutyric acid using a thallic halide catalyst. 4,450,293, Cl. 562-579.000.
Soler Bruguera, Raimon, to Bendiberica S.A. System for adjusting the position of a steering wheel on a vehicle. 4,449,419, Cl. 74-493.000.
Solid State Systems, Corporation: *See*—
Bussiere, Ronald L.; and Smith, Robert J., 4,450,139, Cl. 422-186.300.
Solimeno, Duane; Brown, Sammy K.; Koeppen, Peter L.; and Rogers, Gerald, to Texas Instruments Incorporated. Multiprocessor with dedicated display. 4,450,534, Cl. 364-900.000.
Solvay & Cie: *See*—
Voituron, Georges; and Pleska, Jean-Pierre, 4,450,125, Cl. 264-13.000.
Sone, Shigeru; Ikuta, Yasuhiro; Komiya, Kazuaki; Kihira, Kazuhide; and Mizuno, Nobutaka, to Toyota Jidosha Kogyo Kabushiki Kaisha. Air by-pass system in an internal combustion engine with a supercharger. 4,449,371, Cl. 60-611.000.
Sone, Yoshiaki: *See*—
Ishikawa, Kiyotsugu; Sone, Yoshiaki; Hashimoto, Susumu; Omae, Masanori; and Kunii, Takao, 4,450,475, Cl. 358-44.000.
Sony Corporation: *See*—
Kikuchi, Masahiro; Utena, Hisashi; and Takei, Shinzo, 4,450,379, Cl. 313-477.0HC.
Kobayashi, Katsumi, 4,450,439, Cl. 340-703.000.
Ohta, Shuichi; and Kumagai, Atsuhiro, 4,449,677, Cl. 242-199.000.
Soos, Rudolf; Nemes, Jozsef; Vidra, Laszlo; Szelestei, Miklos; Kovacs, Gabor; and Szekeley, Istvan, to Chinoin Gyogyszer es Vegyeszeti Termekek Gyar Rt. Process for the preparation of unsaturated geminal dihalogen compounds. 4,450,309, Cl. 570-217.000.
Soot, Olaf; and McPhee, Alexander H. Method and apparatus for handling nuclear fuel elements. 4,450,134, Cl. 376-262.000.
Sorba, Antoine: *See*—
Thirion, Andre; Sorba, Antoine; Dany, Jean-Claude; Pacaud, Andre; and Attal, Gerard, 4,449,385, Cl. 70-277.000.
Sorelle, Roland R. Flare ignition system. 4,450,499, Cl. 361-253.000.
Sorensen, Richard L. Firearm support. 4,449,314, Cl. 42-94.000.
Soteland, Nicolai: *See*—
Fritzvold, Bjorn H.; and Soteland, Nicolai, 4,450,044, Cl. 162-65.000.
Southard, Benny S. Tree step. 4,449,612, Cl. 182-92.000.
Southern Research Institute: *See*—
Temple, Carroll G., Jr.; Montgomery, John A.; Elliott, Robert D.; and Wheeler, Glynn P., 4,450,160, Cl. 424-250.000.
Space Structures International Corp.: *See*—
Wendel, Wendel R., 4,449,843, Cl. 403-173.000.
Spahr, Richard F., to Selas Corporation of America. Apparatus for regulating furnace combustion. 4,449,918, Cl. 431-76.000.
Spar Aerospace Limited: *See*—
Hinds, Charles M., 4,449,684, Cl. 244-160.000.
Sparks, Ronald L., to Allied Corporation. Method for obtaining pressurized core samples from underpressurized reservoirs. 4,449,594, Cl. 175-59.000.
Spears, Lonnie K.: *See*—
Betron, Frank A.; Davis, James W.; Kockler, Barry C.; and Spears, Lonnie K., 4,449,811, Cl. 355-3.0SH.
Specht, Glenn E., to Hoover Company, The. Hose coupler locking arrangement. 4,449,737, Cl. 285-7.000.
Spehrley, C. W., Jr., to Xerox Corporation. Stapling apparatus. 4,449,661, Cl. 227-155.000.
Spence, John R., to Rockwell International Corporation. AC Coupled chopper stabilized differential comparator. 4,450,368, Cl. 307-362.000.
Spencer, Tim: *See*—
Dear, Buck; and Spencer, Tim, 4,449,481, Cl. 119-96.000.
Sperry Corporation: *See*—
Denaro, Alfred; and Rand, George, 4,450,544, Cl. 367-176.000.
Kritz, Jacob A., 4,450,542, Cl. 367-150.000.
Mittal, Faquir C.; and Mathias, Joseph S., 4,450,505, Cl. 361-386.000.
Spire Corp.: *See*—
Little, Roger G., 4,450,033, Cl. 156-380.800.
Sprague Electric Company: *See*—
Gontowski, Walter S., Jr., 4,450,415, Cl. 331-111.000.
Sprague, Robert A.: *See*—
Turner, William D.; and Sprague, Robert A., 4,450,459, Cl. 346-160.000.
Spranger, Douglas M.: *See*—
Burbo, James H.; Hartman, Louis P.; Spranger, Douglas M.; Brookes, Malcolm J.; and Mulhauser, Paul J., 4,449,787, Cl. 350-538.000.
Sprecker, Mark A.; and Hall, John B., to International Flavors & Fragrances Inc. Organoleptic compositions with substituted tricyclodecane compounds. 4,450,101, Cl. 252-522.00R.
Spurr, Robert N., to Honeywell Inc. Automatic calibration system for signal amplifier circuits. 4,450,411, Cl. 330-2.000.
Sramek, Bohumir, to BoMed Medical Mfg. Ltd. Noninvasive continuous cardiac output monitor. 4,450,527, Cl. 364-415.000.
SRI International: *See*—
Murray, Edward R.; van der Laan, Jan E.; Rosengreen, Arne; and Byer, Robert L., 4,450,356, Cl. 250-339.000.
Weaver, Charles S., 4,449,536, Cl. 128-696.000.
SS Pharmaceutical Co., Ltd.: *See*—
Eto, Hiromichi; Kohmoto, Teruo; Kouda, Tadayuki; Ogawa, Youichiro; Sato, Susumu; Kuraishi, Tadayuki; and Nakashima, Toshiaki, 4,450,109, Cl. 260-243.300.
Stabler, Gerhard; and Schermutzki, Konrad, to Santrade Ltd. Double band press. 4,449,448, Cl. 100-153.000.
Stacey, David W., deceased: *See*—
Wellhoefer, Felicitas; Stacey, David W., deceased; and Stacey, Lesley A., legal representative, 4,450,471, Cl. 357-80.000.
Stacey, Lesley A., legal representative: *See*—
Wellhoefer, Felicitas; Stacey, David W., deceased; and Stacey, Lesley A., legal representative, 4,450,471, Cl. 357-80.000.
Staebler, Raymond. Mat assembly. 4,450,193, Cl. 428-71.000.
Staffan, Hugh J. Diazo copier. 4,449,815, Cl. 355-106.000.
Staffer, Julius; Walther, Karl-Heinz; and Jahn, Hans-Georg, to Heidelberger Druckmaschinen. Device for drying printed sheets on offset printing presses. 4,449,453, Cl. 101-416.00A.
Stafford, Gery R., to Celanese Corporation. Electrogenerative partial oxidation of organic compounds. 4,450,055, Cl. 204-78.000.
Stahel, Nancy G., to Land O'Lakes, Inc. Method of treating soybean material. 4,450,176, Cl. 426-2.000.
Stahl, Howard D.; and Yuan, Raymond C., to General Foods Corporation. Process for modifying a dairy media for use as a foaming agent. 4,450,182, Cl. 426-565.000.
Stamicarbon B.V.: *See*—
van de Leemput, Lambertus J. M. A.; and Nooijen, Godefridus A. H., 4,450,098, Cl. 502-107.000.
Weterings, Cornelis A.M.; and Janssen, Johannes A., 4,450,142, Cl. 423-8.000.
Stamm, Russell D.; and Wullschleger, Manfred J., to General Instrument Corporation. Keyswitch design. 4,450,332, Cl. 200-340.000.
Standard Oil Company, The: *See*—
Eskamani, Abolghassem; Dernar, Helen D.; and Bartoszek-Loza, Rosemary, 4,450,059, Cl. 204-158.00R.
Fox, Joseph R.; Curatolo, Benedict S.; and Pesa, Frederick A., 4,450,310, Cl. 585-400.000.
Isley, Ralph E.; Prem, Dorothy C.; and Duke, June T., 4,450,254, Cl. 524-399.000.
Jageler, Alfred H.; Bruce, Gary D.; and Mount, Houston B., II, 4,449,593, Cl. 175-58.000.
Standard Oil Company (Indiana): *See*—
Bright, Gary R., 4,450,539, Cl. 367-35.000.
Stanley Works, The: *See*—
Barrieau, Paul B., 4,449,629, Cl. 206-45.190.
Drechsler, Mark A.; and Hutchins, Walter J., 4,449,302, Cl. 33-138.000.
Stauffer Chemical Company: *See*—
Klepeis, John E., 4,450,145, Cl. 423-242.000.
Klepeis, John E., 4,450,146, Cl. 423-304.000.
Mink, Robert I., 4,450,242, Cl. 502-105.000.
Steensma, Peter D.; Weinberg, Murray; Smid, Robert W.; and Finley, Thomas E., to International Telephone and Telegraph Corporation. Asynchronous integrated voice and data communication system. 4,450,554, Cl. 370-4.000.
Steinberg, Marvin P.; and Lioutas, Theodore S., to Steinberg, Marvin P. Process for manufacturing dried meat emulsions. 4,450,183, Cl. 426-646.000.
Steinbrenner, Ulrich: *See*—
Glockler, Otto; Gunther, Dieter; Horbelt, Michael; and Steinbrenner, Ulrich, 4,449,508, Cl. 123-492.000.
Steinecke, Rudolf: *See*—
Strifler, Paul; Geissler, Heinrich; Ludtke, Dieter; Maurath, Rudolf; and Steinecke, Rudolf, 4,449,726, Cl. 280-81.00A.
Steinsberger, Karl; Maier, Albert; and Herrmann, Walter, to AGFA-Gevaert Aktiengesellschaft. Apparatus for threading holes. 4,449,868, Cl. 408-138.000.
Sterling Drug Inc.: *See*—
Morgan, Barry A., 4,450,155, Cl. 424-177.000.
Stern, Michael J., to Atlantic Richfield Company. Laminator for large workpieces. 4,450,034, Cl. 156-382.000.
Sterner Lighting Systems Incorporated: *See*—
Guggemos, Arthur R., 4,450,513, Cl. 362-299.000.
Sterzer, Fred, to RCA Corporation. Pickup circuit for video disc including dual-gate FET with injected RF. 4,450,550, Cl. 369-126.000.
Stewart, Robert E.; Buzynski, John E.; and Giggi, Robert, to Digital Equipment Corporation. Interface for serial data communications link. 4,450,572, Cl. 375-87.000.
Stewart, Roger G.: *See*—
Wacyk, Ihor T.; and Stewart, Roger G., 4,450,562, Cl. 371-51.000.

Stichel, Willi: *See—*
Sauer, Heinz; Stichel, Willi; and Wachter, Gerhard, 4,449,429, Cl. 81-9.300.

Still, Michael: *See—*
Baum, Walter; Still, Michael; and Becker, Erich, 4,449,576, Cl. 165-104.330.

Stobbe, Richard E.: *See—*
Lohneis, Earl R.; and Stobbe, Richard E., 4,449,866, Cl. 408-9.000.

Stockburger, Hermann; and Winderlich, Hans-Georg. Method and device for characterizing and identifying falsification proof data boards. 4,450,348, Cl. 235-380.000.

Stoll, Kurt. Muffler for pneumatic apparatus. 4,449,609, Cl. 181-230.000.

Stone, John B.; and Floyd, Frank M., to Exxon Research and Engineering Co. Hydrothermal pretreatment to prevent scale during liquefaction of certain solid carbonaceous materials. 4,450,066, Cl. 208-8.0LE.

Stoneleigh Trust, The: *See—*
Massa, Donald P., 4,450,436, Cl. 340-531.000.

Storz, Karl. Dilator to facilitate endoscope insertion into the body. 4,449,532, Cl. 128-341.000.

Stotz, Erich: *See—*
Langwieder, Rolf; Rebmann, Rolf; Stotz, Erich; Wierschem, Franz-Rudolf; and Trick, Fred, 4,449,603, Cl. 180-232.000.

Stow Davis Furniture Company: *See—*
Gzym, Larry P.; Ritzema, Lloyd G.; and Haadsma, David K., Jr., 4,449,337, Cl. 52-126.400.

Strain, David H., to Beckman Instruments, Inc. Shell type centrifuge rotor having controlled windage. 4,449,965, Cl. 494-16.000.

Strandli, Kaare R.: *See—*
Foss, Morten; and Strandli, Kaare R., 4,449,456, Cl. 102-240.000.

Stratton, David G. Valley strip for roof structure. 4,449,333, Cl. 52-13.000.

Streifer, William: *See—*
Scifres, Donald R.; Streifer, William; and Burnham, Robert D., 4,450,567, Cl. 372-50.000.

Streit, Werner; Lorenz, Klaus; and Leppert, Norbert, to BASF Aktiengesellschaft. Agent for dissolving insoluble iron(III) compounds in highly alkaline textile treatment liquors. 4,450,083, Cl. 252-8.600.

Strifler, Paul; Geisler, Heinrich; Ludtke, Dieter; Maurath, Rudolf; and Steinecke, Rudolf, to Daimler-Benz Aktiengesellschaft. Control for follow-up steering axles. 4,449,726, Cl. 280-81.00A.

Strobel, Russell A.; Rihani, Jawdat; and Lunquist, Richard E., to Motorola, Inc. Multi-channel transceiver using a single high-stability element. 4,450,583, Cl. 455-86.000.

Strohmeyer, Charles, Jr., to Electrodyne Research Corporation. Unfired drying and sorting apparatus for preparation of solid fuel as a feedstock for a combustor. 4,449,483, Cl. 122-4.00D.

Stubblefield, Jerry D., to Pensa, Inc. Basketball shoe sole. 4,449,307, Cl. 36-32.00R.

Stubbs, Michael E.: *See—*
Adair, Noel J.; Carlisle, Robert W.; Stubbs, Michael E.; and Rooney, John J., 4,450,245, Cl. 502-211.000.

Sturm, Elmar; Schempp, Heinrich; and Martin, Henry, to Ciba-Geigy Corporation. Sulfur-containing oxime compounds, processes for producing them, and their use for protecting cultivated plants. 4,449,999, Cl. 71-73.000.

Sturm, Ruger & Company, Inc.: *See—*
Ruger, William B.; and Melcher, Roy L., 4,449,312, Cl. 42-66.000.

Su, Tsung-Tsan; and Cheng, Yu-Chen, to Industrial Technology Research Institute. Preparation of 2-hydroxyquinoxaline. 4,450,271, Cl. 544-354.000.

Suga, Katsuyuki; Kitada, Toyofumi; Naganawa, Yutaka; and Nakagawa, Hirotaka, to Nippon Kokan Kabushiki Kaisha. Fused flux for inclined submerged arc welding. 4,450,018, Cl. 148-26.000.

Suga, Masaaki; Morimoto, Yoshiro; and Hamada, Hideo, to Nissan Motor Co., Ltd. Lock-up control system for lock-up type automatic transmission. 4,449,618, Cl. 192-3.310.

Sugihara, Mikio: *See—*
Fujita, Taira; Nakagawa, Hiroyuki; Sugihara, Mikio; Kobayashi, Kimiyuki; and Okamoto, Katuhiko, 4,450,114, Cl. 260-458.00C.

Sugimoto, Hitoshi: *See—*
Ishii, Masami; Sugimoto, Hitoshi; Takeda, Shinji; and Shibata, Susumu, 4,450,038, Cl. 156-497.000.

Sugishita, Nobuyuki: *See—*
Fujiwara, Hideo; Kudo, Mitsuhiro; Tamura, Teizo; Sugishita, Nobuyuki; Shiroishi, Yoshihiro; Kimura, Takeshi; Shinagawa, Kiminari; and Kumasaka, Noriyuki, 4,450,494, Cl. 360-125.000.

Sugita, Hiroshi: *See—*
Shimba, Satoru; Ito, Kenji; Tsuda, Yasuo; and Sugita, Hiroshi, 4,450,228, Cl. 430-505.000.

Sugitani, Hiroshi; Ozawa, Masakazu; Matsuda, Hiroto; Ikeda, Masami; and Matsumoto, Haruyuki, to Canon Kabushiki Kaisha. Ink jet head. 4,450,455, Cl. 346-140.0PQ.

Suhr, Peter J.; Brooks, Robert A.; and Banach, Terrance R., to Magnetic Analysis Corporation. Magnetic and ultrasonic objects testing apparatus. 4,449,411, Cl. 73-643.000.

Suk, Albert, to CCL Industries Inc. Propellant-active carrier system for water-based paints. 4,450,253, Cl. 524-378.000.

Sukup, Eugene G. Biomass heat exchanger furnace. 4,449,510, Cl. 126-99.00A.

Sullinger, JoAnn J. Protective garment for a bowler. 4,449,252, Cl. 2-46.000.

Sullivan, Edward F.; Sullivan, Patrick; and Schultz, Walter C. Electrically heated pipe thawing apparatus. 4,449,553, Cl. 138-35.000.

Sullivan, Patrick: *See—*
Egly, Robert A.; and Sullivan, Patrick, 4,449,628, Cl. 206-45.180.

Sullivan, Edward F.; Sullivan, Patrick; and Schultz, Walter C., 4,449,553, Cl. 138-35.000.

Sumitomo Chemical Company, Limited: *See—*
Fujita, Taira; Nakagawa, Hiroyuki; Sugihara, Mikio; Kobayashi, Kimiyuki; and Okamoto, Katuhiko, 4,450,114, Cl. 260-458.00C.

Sumitomo Kinzoku Kogyo Kabushiki Kaisha: *See—*
Matsuo, Tohru; and Aoki, Takeo, 4,450,004, Cl. 75-53.000.

Sundermeier, Gunter, to Paul Hettich & Co. Spring biased furniture hinge having a brake mechanism. 4,449,269, Cl. 16-50.000.

Sundstrand Corporation: *See—*
Ebbing, Steven J.; and Hermans, Robert J., 4,449,442, Cl. 91-44.000.
Sjolund, John R., 4,450,353, Cl. 250-231.00R.

Sundstrom, Karl E. Current control circuit with particular application in bipolar constant current control of step motors. 4,450,517, Cl. 363-124.000.

Suntio, Ossi: *See—*
Makela, Olavi; Suntio, Ossi; and Tuomaala, Jorma, 4,449,557, Cl. 144-357.000.

Suplicki, John C. Air flotation cell. 4,450,072, Cl. 209-170.000.

Surgikos, Inc.: *See—*
Brasfiel, Bernard M., 4,449,911, Cl. 425-374.000.

Surot, Patrick, to Ampafrance S.A. Reversible foldable push-chair for children. 4,449,732, Cl. 280-644.000.

Sutherland, John W.: *See—*
Sanford, Karl J.; Sutherland, John W.; and Eikenberry, Jon N., 4,450,232, Cl. 435-15.000.

Sutton, David L.: *See—*
Burkhalter, John F.; Childs, Jerry D.; and Sutton, David L., 4,450,010, Cl. 106-87.000.

Sutton, Richard C.: *See—*
Klein, Gerald W.; Snow, Robert A.; and Sutton, Richard C., 4,450,224, Cl. 430-213.000.

Suzi Stone Enterprises, Inc.: *See—*
Mariol, James F., 4,449,474, Cl. 116-2.000.

Suzuki, Hikoshiro: *See—*
Mithuhira, Kuniaki; Kamata, Keiji; and Suzuki, Hikoshiro, 4,449,664, Cl. 236-49.000.

Suzuki Iron Works Co., Ltd.: *See—*
Suzuki, Masakazu, 4,449,870, Cl. 409-134.000.

Suzuki, Katsuhisa: *See—*
Mokuya, Hiroichi; Yokko, Masao; Komatsu, Hiroyuki; Suzuki, Katsuhisa; and Kitayama, Takeo, 4,449,496, Cl. 123-198.00F.

Suzuki, Kunihiko, to Nissan Motor Company, Limited. Four-wheel drive system for automotive vehicle. 4,449,604, Cl. 180-233.000.

Suzuki, Masakazu, to Suzuki Iron Works Co., Ltd. T-Slot cover. 4,449,870, Cl. 409-134.000.

Suzuki, Masaru, to Kabushiki Kaisha Tokai Rika Denki Seisakusho. Magnetic angle adjusting arrangement for mirror of motor vehicle. 4,449,788, Cl. 350-289.000.

Suzuki Motor Company Limited: *See—*
Mokuya, Hiroichi; Yokko, Masao; Komatsu, Hiroyuki; Suzuki, Katsuhisa; and Kitayama, Takeo, 4,449,496, Cl. 123-198.00F.

Svenska Rotor Maskiner Aktiebolag: *See—*
Pettersson, Birger; and Karlsson, Kurt, 4,449,573, Cl. 165-10.000.

Swinehart, Carl F., to Harshaw/Filtrol Partnership. Light pipe, laser window and charge stock therefor. 4,449,780, Cl. 350-1.100.

Swiss Aluminium Ltd.: *See—*
Merz, Walter; and Friedli, Hans, 4,450,053, Cl. 204-67.000.

Swoboda, Gary L.: *See—*
McDonough, Kevin C.; Mayn, John W.; Swoboda, Gary L.; and Bellay, Jeffrey D., 4,450,521, Cl. 364-200.000.

SWS Silicones Corporation: *See—*
McAfee, Richard C.; Adkins, James; and Miskowski, Richard L., 4,450,283, Cl. 556-479.000.

Synergetics, Inc.: *See—*
Clark, Ronald G., 4,449,746, Cl. 296-1.00R.

Szachowicz, Edward H.; and Walsh, John, to Implant Technologies, Inc. Talking tracheostomy tube. 4,449,523, Cl. 128-200.260.

Szarka, Frank: *See—*
Lightstone, Alexander W.; Eastwood, H. Keith; and Szarka, Frank, 4,449,781, Cl. 350-96.150.

Szekeley, Istvan: *See—*
Soos, Rudolf; Nemes, Jozsef; Vidra, Laszlo; Szelestei, Miklos; Kovacs, Gabor; and Szekeley, Istvan, 4,450,309, Cl. 570-217.000.

Szelestei, Miklos: *See—*
Soos, Rudolf; Nemes, Jozsef; Vidra, Laszlo; Szelestei, Miklos; Kovacs, Gabor; and Szekeley, Istvan, 4,450,309, Cl. 570-217.000.

Tabak, Samuel A.: *See—*
Angevine, Philip J., Carroll, Michael B.; Shih, Stuart S.; and Tabak, Samuel A., 4,450,067, Cl. 208-86.000.

Tabereaux, Alton T., to Reynolds Metals Company. Alumina reduction cell. 4,450,054, Cl. 204-67.000.

Tabereaux, Alton T.: *See—*
Johnston, Thomas J.; Richards, Nolan E.; and Tabereaux, Alton T., 4,450,063, Cl. 204-400.000.

Tabet, Mansour: *See—*
Forestier, Alexandre; Pinquet, Alain A.; Rosa, Roger A.; Tabet, Mansour; and Teysseyre, Pierre M., 4,449,607, Cl. 181-213.000.

Tachibana, Hideo: *See—*
Kohsaka, Yasuo; Nonaka, Yoshihiro; and Tachibana, Hideo, 4,449,816, Cl. 356-37.000.

Tadokoro, Eiichi; Fujiyama, Masaaki; and Akashi, Goro, to Fuji Photo Film Co., Ltd. Magnetic recording medium. 4,450,199, Cl. 428-317.900.

Taflove, Allen: *See—*
Bridges, Jack E.; and Taflove, Allen, 4,449,585, Cl. 166-248.000.

Taglianetti, Philip C.; and Burkard, Andrew M., to PPG Industries, Inc. Fire containment arrangement for curtain wall construction. 4,449,341, Cl. 52-235.000.

Takabayashi, Katsuyuki: *See*—
Nagasawa, Takeshi; Kuroiwa, Katsumasa; and Takabayashi, Katsuyuki, 4,450,105, Cl. 260-112.50R.

Takagi, Satoshi; Watanabe, Toshio; and Ito, Masao, to Clarion Co., Ltd. Operation lever mechanism for magnetic tape recording/reproducing apparatus. 4,450,491, Cl. 360-96.500.

Takahashi, Ken: *See*—
Miyoshi, Tadahiko; Yamazaki, Takeo; Maeda, Kunihiro; Takahashi, Ken; and Oowada, Siniti, 4,450,426, Cl. 338-21.000.

Takahata, Naomi: *See*—
Furuichi, Katsushi; and Takahata, Naomi, 4,449,812, Cl. 355-14.0SH.

Takai, Kazuki: *See*—
Okada, Hitoshi; Takai, Kazuki; and Yamaguchi, Katsumi, 4,450,492, Cl. 360-105.000.

Takamura, Masayuki; and Kurahashi, Kazuo, to Nippon Gakki Seizo Kabushiki Kaisha. Clad material. 4,450,210, Cl. 428-660.000.

Takano, Toshio: *See*—
Sakakiyama, Ryuzo; and Takano, Toshio, 4,449,617, Cl. 192-0.033.

Takase, Itaru: *See*—
Saito, Hisatoshi; Fujii, Shuzo; Takase, Itaru; Nakamura, Akihiko; and Hara, Yoshihiro, 4,449,861, Cl. 406-39.000.

Takashi, Nogami; and Masayuki, Mitsuhashi, to Shin-Etsu Polymer Co., Ltd. Electroconductive rubbery member and elastic connector therewith. 4,449,774, Cl. 339-59.00M.

Takasugi, Wasao: *See*—
Nakamura, Shigeru; Maeda, Takeshi; Kaku, Toshimitsu; Tsunoda, Yoshito; Takasugi, Wasao; and Kaneda, Tokuya, 4,450,547, Cl. 369-45.000.

Takeda, Shinji: *See*—
Ishii, Masami; Sugimoto, Hitoshi; Takeda, Shinji; and Shibata, Susumu, 4,450,038, Cl. 156-497.000.

Takei, Shinzo: *See*—
Kikuchi, Masahiro; Utena, Hisashi; and Takei, Shinzo, 4,450,379, Cl. 313-477.0HC.

Takei, Yoshiaki; Fujimaki, Yoshihide; and Nomori, Hiroyuki, to Konishiroku Photo Industry Co., Ltd. Photoconductive receptor for an electrophotography. 4,450,218, Cl. 430-59.000.

Takemae, Yoshihiro; Nakano, Tomio; Nakano, Masao; Tsuge, Norihisa; and Ohira, Tsuyoshi, to Fujitsu Limited. Bias-voltage generator. 4,450,515, Cl. 363-60.000.

Takeuchi, Koji: *See*—
Ito, Nobuo; Takeuchi, Koji; Abe, Masahiro; and Ishiguro, Tsuneo, 4,450,267, Cl. 528-99.000.

Takeuchi, Seiji, to Don Fell Limited; and Lawrence Fell Limited. Bag system for transportation of bulk liquids. 4,449,279, Cl. 29-401.100.

Takeuchi, Shigeru, to Kurimoto Iron Works, Ltd. Glass fiber-reinforced cement plates. 4,450,128, Cl. 264-70.000.

Takeuchi, Yasuhisa: *See*—
Kishi, Norimasa; Noso, Kazunori; and Takeuchi, Yasuhisa, 4,450,545, Cl. 367-198.000.

Taki, Yoichiro: *See*—
Osa, Isao; Harashima, Asao; Ozaki, Masaru; and Taki, Yoichiro, 4,450,152, Cl. 424-70.000.

Takigawa, Hiroyoshi: *See*—
Tansei, Hikaru; and Takigawa, Hiroyoshi, 4,449,560, Cl. 152-209.00R.

Takikawa, Osamu; Katsura, Masaki; Tanuma, Chiaki; and Yokoyama, Katsunori, to Tokyo Shibaura Denki Kabushiki Kaisha. Gas combustion apparatus capable of detecting environmental oxygen deficiency. 4,449,919, Cl. 431-76.000.

Takizawa, Hiroshi; Oiji, Yoshimasa; and Kubo, Kazuhiro, to Kyowa Hakko Kogyo Co., Ltd. Amino-alcohol derivatives. 4,450,115, Cl. 260-465.00E.

Tallant, James C., II, to RCA Corporation. Delayed reaction automatic kinescope biasing system. 4,450,476, Cl. 358-74.000.

Tamburrino, Robert M.: *See*—
Anderson, David L.; Hitchcock, Robert F.; and Tamburrino, Robert M., 4,450,081, Cl. 210-445.000.

Tamura, Takashi, to Konishiroku Photo Industry Co., Ltd. Drive unit mounting mechanism for reproducing apparatus. 4,449,809, Cl. 355-3.0DR.

Tamura, Teizo: *See*—
Fujiwara, Hideo; Kudo, Mitsuhiro; Tamura, Teizo; Sugishita, Nobuyuki; Shiroishi, Yoshihiro; Kimura, Takeshi; Shinagawa, Kiminari; and Kumasaka, Noriyuki, 4,450,494, Cl. 360-125.000.

Tan, P. Lu-John. Separable combination boiler. 4,449,485, Cl. 122-209.00R.

Tanaka, Atsuo: *See*—
Donomoto, Tadashi; Tanaka, Atsuo; Tatematsu, Yoshiaki; and Akai, Tsugio, 4,450,207, Cl. 428-614.000.

Tanaka, Hideo: *See*—
Ishido, Yoshinobu; and Tanaka, Hideo, 4,449,713, Cl. 277-1.000.

Tanaka, Kazuyuki, to Matsushita Electric Industrial Co., Ltd. Display processor for superimposed-picture display system. 4,450,442, Cl. 340-814.000.

Tanaka, Masaru, to Sanyo Electric Co., Ltd. Induction motor. 4,450,399, Cl. 318-814.000.

Tanaka, Tadayoshi: *See*—
Tani, Tatsuo; Sawata, Sinji; Tanaka, Tadayoshi; Sakuta, Koichi; Nakamoto, Yasunobu; Sekiya, Hideshi; Morita, Masanobu; and Yamagata, Norio, 4,449,517, Cl. 126-435.000.

Tanaka, Toshihide: *See*—
Saka, Hiroshi; and Tanaka, Toshihide, 4,450,584, Cl. 455-325.000.

Tanaka, Yoshio: *See*—
Watanabe, Tadaaki; and Tanaka, Yoshio, 4,449,955, Cl. 464-78.000.

Tani, Tatsuo; Sawata, Sinji; Tanaka, Tadayoshi; Sakuta, Koichi; Nakamoto, Yasunobu; Sekiya, Hideshi; Morita, Masanobu; and Yamagata, Norio, to Agency of Industrial Science and Technology; and Tokyo Shibaura Denki Kabushiki Kaisha. Solar heat plant. 4,449,517, Cl. 126-435.000.

Tanida, Seiichi: *See*—
Hasegawa, Toru; Izawa, Motowo; and Tanida, Seiichi, 4,450,234, Cl. 435-253.000.

Tanimoto, Akira: *See*—
Ikemoto, Yutaka; and Tanimoto, Akira, 4,449,829, Cl. 368-63.000.

Tanouchi, Masatoshi; and Asahina, Yoshiyuki, to Asahi Kasei Kogyo Kabushiki Kaisha. Method for obtaining uniform stream in adsorption column. 4,450,082, Cl. 210-660.000.

Tansei, Hikaru; and Takigawa, Hiroyoshi, to Bridgestone Tire Company Limited. Heavy duty pneumatic tire. 4,449,560, Cl. 152-209.00R.

Tanuma, Chiaki: *See*—
Takikawa, Osamu; Katsura, Masaki; Tanuma, Chiaki; and Yokoyama, Katsunori, 4,449,919, Cl. 431-76.000.

Tatematsu, Yoshiaki: *See*—
Donomoto, Tadashi; Tanaka, Atsuo; Tatematsu, Yoshiaki; and Akai, Tsugio, 4,450,207, Cl. 428-614.000.

Tatsukawa, Osami: *See*—
Hotta, Kouichi; Yazawa, Yukichi; and Tatsukawa, Osami, 4,450,345, Cl. 219-491.000.

Tatusawa, Kunio: *See*—
Itami, Masaru; and Tatusawa, Kunio, 4,449,831, Cl. 368-165.000.

Tauber, Arthur; Finnegan, Robert D.; and Rothwarf, Frederick, to United States of America, Army. Method of operating a cold cathode-cold reservoir thyratron. 4,449,952, Cl. 445-55.000.

Tawada, Yoshihisa: *See*—
Hamakawa, Yoshihiro; and Tawada, Yoshihisa, 4,450,316, Cl. 136-256.000.

Tayebi, Amad, to United States Tennis Gut Association, Inc. Gut string for sports rackets. 4,449,353, Cl. 57-242.000.

Taylor, James C.; and Barber, Leonard B., Jr. Dental bite relator. 4,449,927, Cl. 433-38.000.

Taylor, Mary J.: *See*—
Childs, Jerry D.; Brothers, Lance E.; and Taylor, Mary J., 4,450,009, Cl. 106-76.000.

Tazawa, Hiroaki: *See*—
Nishizako, Shizutaka; and Tazawa, Hiroaki, 4,450,328, Cl. 200-144.00R.

Techne Electronics, Ltd.: *See*—
Ho, Eugene Y., 4,450,437, Cl. 340-540.000.

Tedford, Richard A., Jr., to Invacare Respiratory Corp. Method and apparatus for fractioning oxygen. 4,449,990, Cl. 55-26.000.

Teepak, Inc.: *See*—
Martinek, Thomas W., 4,450,131, Cl. 264-209.200.

Teijin Limited: *See*—
Masuho, Yasuhiko; and Hara, Takeshi, 4,450,154, Cl. 260-112.00R.
Yamada, Takeyoshi; Kurisu, Shizuka; Azuma, Shizuo; Kawase, Shoji; and Sano, Makoto, 4,449,992, Cl. 55-158.000.

Teitscheid, Heinz-Horst: *See*—
Weyde, Edith; von Rintelen, Harald; Saleck, Wilhelm; and Teitscheid, Heinz-Horst, 4,450,225, Cl. 430-567.000.

Teksid, S.p.A.: *See*—
Pontini, Giovanni, 4,449,390, Cl. 72-405.000.

Tektronix, Inc.: *See*—
Lockwood, Larry R., 4,450,422, Cl. 333-202.000.

Teleflex Incorporated: *See*—
Rump, Martin, 4,449,470, Cl. 114-150.000.

Telefonaktiebolaget L M Ericsson: *See*—
Berg, Bengt O., 4,450,412, Cl. 330-255.000.

Telefunken Electronic GmbH: *See*—
Bohme, Rolf; Rinderle, Heinz; and Sieber, Jurgen, 4,449,404, Cl. 73-295.000.

Telfer, James D., to Coles Cranes Limited. Mobile cranes or aerial lift platforms. 4,449,600, Cl. 180-132.000.

Temple, Carroll G., Jr.; Montgomery, John A.; Elliott, Robert D.; and Wheeler, Glynn P., to Southern Research Institute. 1,2-Dihydropyrido[3,4-b]-pyrazines and method and intermediates for preparing same. 4,450,160, Cl. 424-250.000.

Tennessee Valley Authority: *See*—
Ison, Billy G.; and Hudson, Robert G., 4,449,480, Cl. 119-4.000.

Terada, Sadatugu; Haneda, Satoshi; Tomono, Makoto; and Matsuo, Syunji, to Konishiroku Photo Industry Co., Ltd. Encapsulated lyophilic magnetic particle and resin toner. 4,450,221, Cl. 430-106.600.

Teradyne, Inc.: *See*—
Conner, George W., 4,450,560, Cl. 371-25.000.

Terakawa, Sumio; and Horii, Kenju, to Matsushita Electronics Corporation. Solid states image sensor array having circuit for suppressing image blooming and smear. 4,450,484, Cl. 358-213.000.

Teranishi, Katsuya: *See*—
Saito, Chuichi; Teranishi, Katsuya; Baba, Katsuyoshi; and Osumi, Yoshihiro, 4,449,623, Cl. 198-335.000.

Terasawa, Hidenori; and Hayashi, Kiyoshi, to Nippon Kogaku K.K. Three-group zoom lens. 4,449,791, Cl. 350-427.000.

Terhorst, Gunter; Plester, Karl-Heinz; Rosenberg, Harry; and Eggenstein, Friedrich, to Gewerkschaft Eisenhutte Westfalia. Mineral mining installation. 4,449,859, Cl. 405-291.000.

Tessier, Jean: *See—*
Nezot, Francois; Girault, Pierre; Tessier, Jean; and Martel, Jacques, 4,450,169, Cl. 424-270.000.

Texaco Inc.: *See—*
Moss, Philip H.; and Nieh, Edward C. Y., 4,450,307, Cl. 568-665.000.
Sanderson, John R.; Watts, Lewis W., Jr.; and Brader, Walter H., Jr., 4,450,290, Cl. 560-246.000.

Texas Instruments Incorporated: *See—*
Guttag, Karl M.; and Laws, Gerald E., 4,450,519, Cl. 364-200.000.
McDonough, Kevin C.; Mayn, John W.; Swoboda, Gary L.; and Bellay, Jeffrey D., 4,450,521, Cl. 364-200.000.
Purdes, Andrew J., 4,450,042, Cl. 156-643.000.
Solimeno, Duane; Brown, Sammy K.; Koeppen, Peter L.; and Rogers, Gerald, 4,450,534, Cl. 364-900.000.

Teysseyre, Pierre M.: *See—*
Forestier, Alexandre; Pluquet, Alain A.; Rosa, Roger A.; Tabet, Mansour; and Teysseyre, Pierre M., 4,449,607, Cl. 181-213.000.

Tezuka, Etsuhiro; Kaji, Koichiro; and Ichinose, Toru, to Yamaha Hatsudoki Kabushiki Kaisha. Internal combustion engine. 4,449,505, Cl. 123-447.000.

Theeuwes, Felix: *See—*
Cortese, Richard; Barclay, Brian; and Theeuwes, Felix, 4,449,983, Cl. 604-892.000.

Theimer, Siegfried. Exposure device. 4,449,814, Cl. 355-85.000.

Theze, Claude P.: *See—*
Salmon, Jean P.; and Theze, Claude P., 4,449,685, Cl. 246-8.000.

Thirion, Andre; Sorba, Antoine; Dany, Jean-Claude; Pacaud, Andre; and Attal, Gerard, to Antivols Simplex. Electro-mechanical anti-theft device for automobile vehicles. 4,449,385, Cl. 70-277.000.

Thomas, Alfred W.: *See—*
Rath, Heinrich B.; and Thomas, Alfred W., 4,449,757, Cl. 303-6.00C.

Thomas, Terence N.: *See—*
Boleda, Alberto; and Thomas, Terence N., 4,450,556, Cl. 370-58.000.

Thompson, Michael N.: *See—*
Marien, Hendricus C. J.; and Thompson, Michael N., 4,450,355, Cl. 250-310.000.

Thompson, Neil E. S.; Redmore, Derek; Oude Alink, Bernardus A.; and Outlaw, Benjamin T., to Petrolite Corporation. Processes for inhibiting corrosion using compounds containing sulfur and amino groups. 4,450,137, Cl. 422-12.000.

Thompson, Neil E. S.; Redmore, Derek; Oude Alink, Bernardus A.; and Outlaw, Benjamin T., to Petrolite Corporation. Processes for inhibiting corrosion using compounds containing sulfur and amino groups. 4,450,138, Cl. 422-12.000.

Thomson-CSF: *See—*
Diamand, Felix, 4,450,372, Cl. 307-511.000.
Huignard, Jean-Pierre; and Herriau, Jean-Pierre, 4,449,785, Cl. 350-3.610.
Nuyen, Trong L., 4,450,462, Cl. 357-23.000.

Thoni, Werner, to Balzers Aktiengesellschaft. Electrochromic layer system. 4,449,790, Cl. 350-357.000.

Thorn Emi plc: *See—*
Henry, Ivor C., 4,450,509, Cl. 362-216.000.

Thornton, Richard D., to Massachusetts Institute of Technology. Electrically controlled synchronous machine. 4,450,396, Cl. 318-721.000.

Thorpe, Kenneth J., to Shenkman, Mitchell B. Insulated chest. 4,449,378, Cl. 62-371.000.

Tiemann, Jerome J., to General Electric Company. Low loss wide band front end for NMR receiver. 4,450,408, Cl. 324-318.000.

Tietjen, Byron W., to General Electric Company. Bias compensated optical grating hydrophone. 4,450,541, Cl. 367-149.000.

Tiglhman Wheelabrator Limited: *See—*
MacMillan, William R., 4,449,331, Cl. 51-425.000.

Tloczynski, James J.; Ahola, Clifford J.; Rosenstein, Nicholas D.; and Rine, James C., to Goodyear Tire & Rubber Company, The. Comminuting apparatus with improved feed system. 4,449,670, Cl. 241-35.000.

Tloczynski, James J.; Budzol, Melvin; Ahola, Clifford J.; and Rine, James C., to Goodyear Tire & Rubber Company, The. Comminuting apparatus with improved impeller construction. 4,449,674, Cl. 241-245.000.

TMC Corporation: *See—*
Krob, Erwin; and Bauer, Helmut, 4,449,729, Cl. 280-605.000.
Oberleitner, Gerhard; and Nitschko, Theodor, 4,449,730, Cl. 280-625.000.

Toda, Minoru; and Osaka, Susumu, to RCA Corporation. Counterbalance system for sagging rotating element. 4,449,563, Cl. 160-184.000.

Toei Denki Kabushiki Kaisha: *See—*
Kawamura, Akira; and Ono, Tadahiro, 4,450,395, Cl. 318-700.000.

Toerner, Ludger; Garvens, Dieter; Hager, Gunter; and Rettinger, Anton, to Carl Schenck AG. Flexible sleeve type connecting structure. 4,449,742, Cl. 285-236.000.

Tokai Metals Company, Limited: *See—*
Hirata, Isao, 4,450,581, Cl. 383-42.000.

Tokico Ltd.: *See—*
Tsuge, Kazuo, 4,449,721, Cl. 277-221.000.

Tokiwa, Taisuke: *See—*
Kitamura, Takashi; Watanabe, Asao; Nakano, Takashi; Masaki, Katsumi; Hirayama, Kazuhiro; Sato, Yasushi; and Tokiwa, Taisuke, 4,450,453, Cl. 346-108.000.

Tokoro, Takehiko; Kashima, Shoichi; and Murata, Mineo, to Nihon Soil Engineering Co., Ltd.; Nihon Sogo-Bosui Co., Ltd.; and Yamaguchi Kikai Kogyo Co., Ltd. Grout injection method and apparatus. 4,449,856, Cl. 405-269.000.

Tokumaru, Hisashi: *See—*
Nakamura, Akiyoshi; and Tokumaru, Hisashi, 4,449,793, Cl. 350-458.000.

Tokyo Shibaura Denki Kabushiki Kaisha: *See—*
Ando, Hideo; Nakagawa, Toshiharu; and Fujimori, Yoshinori, 4,450,452, Cl. 346-135.100.
Miyazaki, Yoshiro; Yasunaga, Toshio; and Sasaki, Tomiya, 4,449,579, Cl. 165-104.330.
Sakamoto, Moriyoshi; and Saito, Toshihiko, 4,449,484, Cl. 122-13.00R.
Sato, Hideki; and Asahina, Hiroshi, 4,450,577, Cl. 378-109.000.
Shibuya, Kunihiro; and Uchida, Kohachi, 4,449,705, Cl. 271-9.000.
Shirasaka, Hisatoshi, 4,450,538, Cl. 365-219.000.
Takikawa, Osamu; Katsura, Masaki; Tanuma, Chiaki; and Yokoyama, Katsunori, 4,449,919, Cl. 431-76.000.
Tani, Tatsuo; Sawata, Sinji; Tanaka, Tadayoshi; Sakuta, Koichi; Nakamoto, Yasunobu; Sekiya, Hideshi; Morita, Masanobu; and Yamagata, Norio, 4,449,517, Cl. 126-435.000.
Yamada, Noboru, 4,449,836, Cl. 400-124.000.

Tolf, Carl O., Jr.: *See—*
Benlolo, Leon; and Tolf, Carl O., Jr., 4,449,588, Cl. 169-48.000.

Tomono, Makoto: *See—*
Haneda, Satoshi; Itoh, Takashi; Nakamura, Ken; and Tomono, Makoto, 4,450,220, Cl. 430-102.000.
Terada, Sadatugu; Haneda, Satoshi; Tomono, Makoto; and Matsuo, Syunji, 4,450,221, Cl. 430-106.600.

Tone, Junsuke: *See—*
Celmer, Walter D.; Cullen, Walter P.; Shibakawa, Riichiro; and Tone, Junsuke, 4,450,237, Cl. 435-253.000.

Topre Corporation: *See—*
Mithuhira, Kuniaki; Kamata, Keiji; and Suzuki, Hikoshiro, 4,449,664, Cl. 236-49.000.

Toray Silicone Company, Ltd.: *See—*
Ona, Isao; Harashima, Asao; Ozaki, Masaru; and Taki, Yoichiro, 4,450,152, Cl. 424-70.000.

Toshiba Kikai Kabushiki Kaisha: *See—*
Kawamura, Akira; and Ono, Tadahiro, 4,450,395, Cl. 318-700.000.

Townmotor Corporation: *See—*
Dietrick, Earl T.; and Prayner, Timothy F., 4,450,341, Cl. 219-137.520.

Townsend, Marshall A.: *See—*
Hoff, Marcian E., Jr.; Townsend, Marshall A.; and Dreyer, Stephen F., 4,450,365, Cl. 307-262.000.

Toyo Aerosol Industry Co., Ltd.: *See—*
Shinozawa, Takahiro, 4,450,151, Cl. 424-46.000.

Toyo Kogyo Co., Ltd.: *See—*
Satou, Kazuo; and Yoritaka, Masashi, 4,450,019, Cl. 148-35.000.

Toyoda Koki Kabushiki Kaisha: *See—*
Hasegawa, Toshifumi; and Kanii, Norikazu, 4,449,277, Cl. 29-33.00P.

Toyota Jidosha Kabushiki Kaisha: *See—*
Donomoto, Tadashi; Tanaka, Atsuo; Tatematsu, Yoshiaki; and Akai, Tsugio, 4,450,207, Cl. 428-614.000.
Moriguchi, Koichi; Iwamoto, Kenzi; Matushiro, Ryuichi; Kawai, Hisasi; Mizuno, Nobutaka; and Ikuta, Yasuhiro, 4,449,367, Cl. 60-602.000.
Nakamura, Norihiko; Ito, Takaaki; Katou, Takashi; Ota, Yozo; and Morino, Toshiharu, 4,450,117, Cl. 261-39.00A.

Toyota Jidosha Kogyo Kabushiki Kaisha: *See—*
Sone, Shigeru; Ikuta, Yasuhiro; Komiya, Kazuaki; Kihira, Kazuhide; and Mizuno, Nobutaka, 4,449,371, Cl. 60-611.000.
Yaegashi, Takehisa; Aoki, Keiji; and Hashikawa, Kenzo, 4,450,528, Cl. 364-431.050.
Yasumatsu, Jun; Mori, Mamoru; Nishiwaki, Toshihito; and Owada, Akira, 4,449,752, Cl. 297-341.000.

Transaction Security, Inc.: *See—*
Hastings, Otis H., 4,449,764, Cl. 312-236.000.

Transidyne General Corporation: *See—*
Sarrine, Robert J., 4,449,519, Cl. 128-4.000.

Trauter, Joachim: *See—*
Voswinckel, Gerhard; and Trauter, Joachim, 4,449,476, Cl. 118-674.000.

TRE Corporation: *See—*
Conn, Charles E., Jr., 4,450,338, Cl. 219-78.120.

Tremblay, J. Gerard. Panel assembly. 4,449,346, Cl. 52-509.000.

Tremmel, Robert A., to OMI International Corporation. Bright nickel-iron alloy electroplating bath and process. 4,450,051, Cl. 204-43.00T.

Trescol, Jean-Jacques: *See—*
Floreancig, Antoine; Siffert, Bernard; and Trescol, Jean-Jacques, 4,450,143, Cl. 423-10.000.

Trick, Fred: *See—*
Langwieder, Rolf; Rebmann, Rolf; Stotz, Erich; Wierschem, Franz-Rudolf; and Trick, Fred, 4,449,603, Cl. 180-232.000.

Trozzi, Norman K., to Foster Wheeler Energy Corporation. Adjustable particle classifier. 4,450,071, Cl. 209-144.000.

Trumper, Reinhard, to O & K Orenstein & Koppel AG. Sluing drive for excavator. 4,449,364, Cl. 60-403.000.

Trus-Us, Inc.: *See—*
Shacket, Sheldon; and Helfman, Robert, 4,449,334, Cl. 52-79.300.

TRW Inc.: *See—*
Basov, Emma; and Grois, Igor, 4,449,784, Cl. 350-96.210.
Blazek, William S.; and Piwonka, Thomas S., 4,449,567, Cl. 164-137.000.
Drutchas, Gilbert H., 4,449,506, Cl. 123-458.000.

Tschirn, Thomas N.: *See*—
Buckley, Michael E.; Tschirn, Thomas N.; McClure, Donald R.; and Wieland, Michael S., 4,449,458, Cl. 102-430.000.

Tsuchiyama, Tadashi; and Hidaka, Yoshiaki, to Honda Giken Kogyo Kabushiki Kaisha. Lubricating device for internal combustion engine. 4,449,491, Cl. 123-90.340.

Tsuda, Hisanori: *See*—
Miyachi, Takeshi; Tsuda, Hisanori; Hara, Toshitami; and Kasugayama, Yukio, 4,450,457, Cl. 346-140.00R.

Tsuda, Yasuo: *See*—
Shimba, Satoru; Ito, Kenji; Tsuda, Yasuo; and Sugita, Hiroshi, 4,450,228, Cl. 430-505.000.

Tsuge, Kazuo, to Tokico Ltd. Split piston ring having stepped ends. 4,449,721, Cl. 277-221.000.

Tsuge, Norihisa: *See*—
Takemae, Yoshihiro; Nakano, Tomio; Nakano, Masao; Tsuge, Norihisa; and Ohira, Tsuyoshi, 4,450,515, Cl. 363-60.000.

Tsuno, Katsushige, to Jeol Ltd. Electron lens equipped with three magnetic pole pieces. 4,450,357, Cl. 250-356.0ML.

Tsunoda, Yoshito: *See*—
Nakamura, Shigeru; Maeda, Takeshi; Kaku, Toshimitsu; Tsunoda, Yoshito; Takasugi, Wasao; and Kaneda, Tokuya, 4,450,547, Cl. 369-45.000.

Tuchida, Isamu. Roller for adjusting the width of a travelling web. 4,449,659, Cl. 226-190.000.

Tucker, Jeffrey C.; Edmundson, H. Dale; Wigley, David L.; and Vallo, Mark F. Energy (test) door. 4,449,393, Cl. 73-40.000.

Tuckerman, David B.; and Pease, Roger F. W., to Leland Stanford Junior University, The Board of Trustees of the. Method and means for improved heat removal in compact semiconductor integrated circuits and similar devices utilizing coolant chambers and microscopic channels. 4,450,472, Cl. 357-82.000.

Tuin, Hermanus N., to U.S. Philips Corporation. Apparatus for saturating a gas with the vapor of a liquid. 4,450,118, Cl. 261-147.000.

Tuomaala, Jorma: *See*—
Makela, Olavi; Sumtio, Ossi; and Tuomaala, Jorma, 4,449,557, Cl. 144-357.000.

Turner, Jeffrey A. Computer desk. 4,449,762, Cl. 312-196.000.

Turner, Roger S. Optical projection viewing system. 4,449,799, Cl. 353-39.000.

Turner, William D.; and Sprague, Robert A., to Xerox Corporation. Differential encoding for fringe field responsive electro-optic line printers. 4,450,459, Cl. 346-160.000.

Tutherly, Herbert W., to United Technologies Corporation. Flow control device. 4,449,548, Cl. 137-468.000.

Tyler, Loren E., to Lor-Al Corporation. Apparatus for folding an outboard boom on a liquid spraying implement. 4,449,667, Cl. 239-167.000.

Tyler Refrigeration Corporation: *See*—
Ibrahim, Fayez F., 4,449,374, Cl. 62-81.000.

U.S.D. Corp.: *See*—
Germe, Patrick P., 4,449,655, Cl. 224-153.000.

Ube Industries Limited: *See*—
Kamioka, Toshiharu; Nakayama, Isao; Honda, Takeo; Kobayashi, Takashi; Obata, Tokio; Fujii, Katsutoshi; Kojima, Mikio; and Akiyoshi, Yuji, 4,450,162, Cl. 424-251.000.

Uchida, Kohachi: *See*—
Shibuya, Kunihiro; and Uchida, Kohachi, 4,449,705, Cl. 271-9.000.

Ueda, Yoshiteru: *See*—
Hirata, Makizo; and Ueda, Yoshiteru, 4,449,608, Cl. 181-228.000.

Uemura, Akira: *See*—
Akita, Shinji; Hatanaka, Masayuki; and Uemura, Akira, 4,449,386, Cl. 72-100.000.

Ueno, Jiro: *See*—
Nakata, Koreaki; Ueno, Jiro; and Ogawa, Yasuhiro, 4,450,049, Cl. 204-35.00N.

Ueno, Yasuo. Constant-velocity universal joint. 4,449,956, Cl. 464-149.000.

Uetrecht, Dale M.: *See*—
Cotton, Robert B., Jr.; and Uetrecht, Dale M., 4,449,437, Cl. 84-1.010.

Ugon, Michel: *See*—
de Pommery, Bertrand J. C. H.; and Ugon, Michel, 4,450,535, Cl. 364-900.000.

Uhlig, Uwe: *See*—
Redeker, Werner; and Uhlig, Uwe, 4,449,988, Cl. 51-165.800.

Ullner, Klaus, to Buhler-Miag GmbH. Pipe switch for pneumatic conveying devices. 4,449,863, Cl. 406-182.000.

Umeda, Hiroyuki: *See*—
Ogata, Haruki; and Umeda, Hiroyuki, 4,449,676, Cl. 242-198.000.

Underwood, Ronald E., to Binney & Smith Inc. Drawing instrument and locking apparatus therefor. 4,449,304, Cl. 33-437.000.

Unger, H. Peter O.: *See*—
Westberg, J. Eric H.; and Unger, H. Peter O., 4,449,964, Cl. 494-16.000.

Uni-Cardan Aktiengesellschaft: *See*—
Krude, Werner, 4,449,954, Cl. 464-36.000.

Union Carbide Corporation: *See*—
Davis, Stephen G., 4,450,214, Cl. 429-194.000.
Kurtz, Stuart J.; De Rossett, Terry A.; and Shaw, Montgomery T., 4,449,395, Cl. 73-56.000.

Uniox SRL Welding & Cutting: *See*—
Renato, Rinaldi, 4,449,698, Cl. 266-48.000.

Unisplay, S.A.: *See*—
Salam, Hassan P. A., 4,449,934, Cl. 433-143.000.

United Kingdom Atomic Energy Authority: *See*—
Pugh, Harold, 4,449,413, Cl. 73-780.000.

United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the: *See*—
Dodd, Frederick H., 4,449,255, Cl. 2-428.000.
Janes, Timothy W.; and White, John C., 4,449,285, Cl. 29-571.000.

United States Gypsum Company: *See*—
Galer, Richard E., 4,450,022, Cl. 156-42.000.
Reicherts, James E., 4,449,338, Cl. 52-127.800.

United States of America
Agriculture: *See*—
Anthony, William S., 4,449,391, Cl. 73-32.00R.
Army: *See*—
F'Geppert, Erwin, 4,449,621, Cl. 192-70.130.
Homan, Clarke G.; Kendall, David P.; and MacCrone, Robert K., 4,450,086, Cl. 252-62.510.
Nielsen, Paul H.; and McCormack, Ray G., 4,450,434, Cl. 340-506.000.
Sawka, Steven; Moretti, Vincent; and Heal, Sam F., 4,450,382, Cl. 315-082.000.
Tauber, Arthur; Finnegan, Robert D.; and Rothwarf, Frederick, 4,449,952, Cl. 445-55.000.
Commerce: *See*—
Schwiesow, Ronald L., 4,449,823, Cl. 356-346.000.
Energy: *See*—
Hill, Ronald A., 4,450,578, Cl. 378-152.000.
National Aeronautics and Space Administration: *See*—
Achar, Bappalige N.; Fohlen, George M.; and Parker, John A., 4,450,268, Cl. 528-327.000.
Higa, Walter H., 4,449,894, Cl. 417-328.000.
Ream, Lloyd W., 4,449,370, Cl. 60-606.000.
Selcuk, M. Kudret, 4,449,514, Cl. 126-418.000.
Singh, Jag J., 4,449,400, Cl. 73-189.000.
Zebker, Howard A.; Held, Daniel N.; Goldstein, Richard M.; and Bickler, Thomas C., 4,450,447, Cl. 343-17.700.
Navy: *See*—
Aklufi, Monti E., 4,450,041, Cl. 156-628.000.
Bobb, Lloyd C., 4,450,406, Cl. 324-247.000.
Buckley, Michael E.; Tschirn, Thomas N.; McClure, Donald R.; and Wieland, Michael S., 4,449,458, Cl. 102-430.000.
Kimura, Wayne D., 4,449,789, Cl. 350-319.000.
Matteson, William R., 4,449,939, Cl. 434-12.000.
McCrory, William W.; Quigley, William B.; and Garnett, William A., 4,449,473, Cl. 114-354.000.
Meyer, John R., r., 4,449,472, Cl. 114-274.000.
Wehner, Donald R.; and Prickett, Michael J., 4,450,444, Cl. 343-5.0CM.
Woolaver, Dennis A.; and Baitis, A. Erich, 4,449,469, Cl. 114-150.000.

U.S. Philips Corporation: *See*—
Franken, Adrianus; J. J.; and Hagen, Johannes L. M., 4,449,834, Cl. 384-99.000.
Gaslonde, Jean-Pierre, 4,450,392, Cl. 318-317.000.
Gaulier, Yves, 4,450,048, Cl. 204-15.000.
Holster, Peter L.; and Wittkamper, Johannes M., 4,450,553, Cl. 369-275.000.
Horne, David R., 4,450,479, Cl. 358-113.000.
Jekel, Gerd; and Obenaus, Franz, 4,450,456, Cl. 346-140.00R.
Maas, Henricus G. R.; and Appels, Johannes A., 4,449,287, Cl. 29-580.000.
Marien, Hendricus C. J.; and Thompson, Michael N., 4,450,355, Cl. 250-310.000.
Meuleman, Lambertus J.; van de Grijp, Abram; and Roza, Engel, 4,450,564, Cl. 372-26.000.
Schinke, Franz, 4,449,475, Cl. 118-645.000.
Tuin, Hermanus N., 4,450,118, Cl. 261-147.000.
Van Der Valk, Nicolaas J. L., 4,450,473, Cl. 358-10.000.
van Vliet, Johannes A. J. M.; and van der Kooi, Auke G., 4,450,383, Cl. 315-106.000.
White, Roger P., 4,450,440, Cl. 340-753.000.

United States Tennis Gut Association, Inc.: *See*—
Tayebi, Amad, 4,449,353, Cl. 57-242.000.

United Technologies Corporation: *See*—
Cole, Edward F.; and Crombie, Dean H., 4,449,359, Cl. 60-39.094.
Degnan, William G.; and Fansler, John D., 4,449,446, Cl. 92-146.000.
Tutherly, Herbert W., 4,449,548, Cl. 137-468.000.

University of Illinois Foundation: *See*—
Hollaar, Lee A.; and Haskin, Roger L., 4,450,520, Cl. 364-200.000.

University of Toronto Innovations Foundation, The: *See*—
May, Albert D., 4,449,825, Cl. 356-349.000.

University of Washington: *See*—
Auth, David C.; Lawrence, Dale M.; and Majoch, Tim R., 4,449,528, Cl. 128-303.100.

UOP Inc.: *See*—
Brunelle, Rene J., 4,449,875, Cl. 410-80.000.
Urban, Peter; Johnson, Russell W.; and Hilfman, Lee, 4,449,586, Cl. 166-303.000.

Upjohn Company, The: *See*—
Anderson, David J.; and Loughman, Barbara E., 4,450,159, Cl. 424-246.000.

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Okano, Reijiro; and Usami, Kiyoshi, 4,449,622, Cl. 192-84.00C.

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Yoshino, Masataka; Hashimoto, Yoshiki; and Ushikosi, Yasunori, 4,449,574, Cl. 165-11.00R.

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Gilbride, Andrew J.; Malecki, Edward S.; Winslow, Edward H., III; and Coleman, Robert F., 4,449,463, Cl. 112-121.260.

Utena, Hisashi: *See*—
Kikuchi, Masahiro; Utena, Hisashi; and Takei, Shinzo, 4,450,379, Cl. 313-477.0HC.

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Nielsen, Elgard, 4,449,327, Cl. 49-390.000.

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Nikomarov, Samuil S.; Kochnev, Anatoly M.; Goldobin, Vladimir B.; Sarapulov, Jury M.; and Valdman, Isaak Y., 4,449,953, Cl. 464-19.000.

Valeo Societe Anonyme: *See*—
Dauvergne, Jean L. R., 4,449,369, Cl. 60-556.000.

Vallo, Mark F.: *See*—
Tucker, Jeffrey C.; Edmundson, H. Dale; Wigley, David L.; and Vallo, Mark F., 4,449,393, Cl. 73-40.000.

Vamco Machine & Tool, Inc.: *See*—
Gentile, Joseph P., 4,449,658, Cl. 226-138.000.

van Baalen, Anton: *See*—
Versluis, Jan; deGroot, Johan; and van Baalen, Anton, 4,449,946, Cl. 441-4.000.

van de Grijp, Abram: *See*—
Meuleman, Lambertus J.; van de Grijp, Abram; and Roza, Engel, 4,450,564, Cl. 372-26.000.

van de Leemput, Lambertus J. M. A.; and Nooijen, Godefridus A. H., to Stamicarbon B.V. Process for preparing a polymerization catalyst and preparation of ethylene polymers with this catalyst. 4,450,098, Cl. 502-107.000.

van den Brink, Anthonie, to Eurotool B.V. Closure system for liquid injection apparatuses. 4,449,915, Cl. 425-564.000.

van den Nosterum, Ad~ianus: *See*—
Esser, Wilhelm C. J.; and van den Nosterum, Adrianus, 4,449,773, Cl. 339-59.00M.

van der Kooi, Auke G.: *See*—
van Vliet, Johannes A. J. M.; and van der Kooi, Auke G., 4,450,383, Cl. 315-106.000.

van der Laan, Jan E.: *See*—
Murray, Edward R.; van der Laan, Jan E.; Rosengreen, Arne; and Byer, Robert L., 4,450,356, Cl. 250-339.000.

van der Lely, Cornelis. Torque converter. 4,449,960, Cl. 474-242.000.

van der Mass, Hendrikus J. H., to Chemische Fabriek Zaltbommel, B.V. Method of manufacturing anhydrous 2-hydroxy-3-chloropropane trimethylammonium chloride. 4,450,295, Cl. 564-294.000.

Van Der Valk, Nicolaas J. L., to U.S. Philips Corp. Camera system for color television. 4,450,473, Cl. 358-10.000.

Van de Sande, Christian C.: *See*—
Van Poucke, Raphael K.; Van de Sande, Christian C.; and Verhecken, Andree , 4,450,223, Cl. 430-223.000.

Van Gemert, Barry: *See*—
Lavanish, Jerome M.; and Van Gemert, Barry, 4,449,998, Cl. 71-92.000.

van Haren, Lambertus F. W., to Protecon B.V. Method and device for measuring the fat content of meat. 4,449,406, Cl. 73-433.000.

Van Poucke, Raphael K.; Van de Sande, Christian C.; and Verhecken, Andree , to AGFA-Gevaert, N.V. Diffusion transfer material and process. 4,450,223, Cl. 430-223.000.

van Roon, Johannes. Steering combination of pusher tug and barges. 4,449,471, Cl. 114-249.000.

van Vliet, Johannes A. J. M.; and van der Kooi, Auke G., to U.S. Philips Corporation. Electric arrangement for starting and supplying a low-pressure discharge lamp. 4,450,383, Cl. 315-106.000.

Vapor Corpraion: *See*—
Alexander, William H.; and Dare, Roy R., 4,449,695, Cl. 251-214.000.

Varco International, Inc.: *See*—
Boyadjieff, George I., 4,449,596, Cl. 175-85.000.

Varian Associates, Inc.: *See*—
Hertel, Richard J.; and MacIntosh, Edward D., 4,449,885, Cl. 414-750.000.

Veda, Inc.: *See*—
Buschbom, Floyd E.; and Hansen, Glen D., 4,449,606, Cl. 180-297.000.

Vergne, Jean-Claude E.: *See*—
de Pommery, Bertrand J. C. H.; Petiot, Gerard L. R.; Vergne, Jean-Claude E.; and Goupil, Jean-Paul C., 4,449,775, Cl. 339-75.0MP.

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Van Poucke, Raphael K.; Van de Sande, Christian C.; and Verhecken, Andree , 4,450,223, Cl. 430-223.000.

Vernor, Oliver W.; and Brockman, Arthur M. Breakaway safety valve. 4,449,545, Cl. 137-68.00R.

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Veyo, Stephen E.: *See*—
Draper, Robert; Lackey, Robert S.; Fagan, Thomas J., Jr.; Veyo, Stephen E.; and Humphrey, Joseph R., 4,449,376, Cl. 62-259.100.

Vianova Kunstharz, A.G.: *See*—
Behmel, Lukas K.; and Zuckert, Bertram, 4,450,257, Cl. 525-437.000.

Vickers, Incorporated: *See*—
Lambeck, Raymond P., 4,449,898, Cl. 418-61.00B.

Victor Company of Japan, Ltd.: *See*—
Fujii, Yasuhiko; Kikuchi, Mitsuru; and Saito, Hiroyuki, 4,450,490, Cl. 360-13.000.
Koide, Hajime, 4,450,487, Cl. 358-335.000.
Moriyama, Masaru, 4,450,433, Cl. 340-347.0DA.
Ogata, Haruki; and Umeda, Hiroyuki, 4,449,676, Cl. 242-198.000.

Vidra, Laszlo: *See*—
Soos, Rudolf; Nemes, Jozsef; Vidra, Laszlo; Szelestei, Miklos; Kovacs, Gabor; and Szekeley, Istvan, 4,450,309, Cl. 570-217.000.

Viet, Vu H.: *See*—
Sadler, Fred S.; Hettwer, Paul F.; Viet, Vu H.; and Acker, Clarence R., 4,450,424, Cl. 336-94.000.

Vignaud, Rene, to Societe les Piles Wonder. Electrochemical generator comprising a thin gas electrode. 4,450,211, Cl. 429-27.000.

Viles, Alan H., to Abex Corporation. Recirculating roller bearing rocker cam support. 4,449,445, Cl. 92-12.200.

Vilutis and Co., Inc.: *See*—
Vilutis, Leonard J., 4,450,028, Cl. 156-198.000.

Vilutis, Leonard J., to Vilutis and Co., Inc. Method of making laminated multi-layered film enclosures. 4,450,028, Cl. 156-198.000.

Viniol, Gerd: *See*—
Lautenschlager, Karl; and Viniol, Gerd, 4,449,689, Cl. 248-544.000.

Vink, Walter V.; and Aldrich, Deborah G., to Nabisco Brands, Inc. Two component soft candy. 4,450,179, Cl. 426-103.000.

Vitalink Communications Corporation: *See*—
Russell, Steven P., 4,450,582, Cl. 455-12.000.

Vitobello, Vincenza; Branduzzi, Paolo; and Cimini, Nadia, to E. N. I. Ente Nazionale Idrocarburi. Biologically pure culture of *Saccharomyces cerevisiae*. 4,450,238, Cl. 435-256.000.

Voegeli, Ronald C., to Leco Engineering & Machine, Inc. Knock-down vending rack. 4,449,643, Cl. 221-226.000.

Voituron, Georges; and Pieska, Jean-Pierre, to Solvay & Cie. Process for the production of polypropylene fibrids. 4,450,125, Cl. 264-13.000.

Volk, Heinrich, to Esselte Pendaflex Corporation. Portable labeling machine. 4,450,036, Cl. 156-384.000.

Volker, Herbert: *See*—
Domesle, Rainer; Volker, Herbert; Koberstein, Edgar; and Pletka, Hans-Dieter, 4,450,244, Cl. 502-185.000.

Volkswagenwerk AG: *See*—
Kruger, Hermann; and Deutsch, Hermann, 4,449,487, Cl. 123-41.340.

Volkswagenwerk Aktiengesellschaft: *See*—
Fiala, Ernst, 4,449,495, Cl. 123-198.0DB.
Fiala, Ernst; Schael, Fritz; and Schoedder, Reiner, 4,449,748, Cl. 296-183.000.

Vollmer Werke Maschinenfabrik GmbH: *See*—
Beck, Ernst; Lenard, Peter; and Pokorny, Erich, 4,449,427, Cl. 76-77.000.

Von Bodungen, George A.; and Karg, Rudy F., to Copolymer Rubber & Chemical Corp. Emulsion polymerization. 4,450,260, Cl. 526-213.000.

von Rintelen, Harald: *See*—
Weyde, Edith; von Rintelen, Harald; Saleck, Wilhelm; and Teitscheid, Heinz-Horst, 4,450,225, Cl. 430-567.000.

von Weissenfluh, Beat, to Hawe-Neos Dental Dr. H. v. Weissenfluh SA. Universal cervical matrix for dental use. 4,449,928, Cl. 433-40.000.

Vossen, Franz, to Meurer Non Food Product GmbH. Carrying or holding device for at least one cup or the like vessel as well as a blank therefore. 4,449,744, Cl. 294-87.200.

Voswinckel, Gerhard; and Trauter, Joachim, to Gebrueder Sucker. Apparatus for coating or impregnating a guided substrate in the form of a web. 4,449,476, Cl. 118-674.000.

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Orlov, Naum Y.; and Dotsenko, Taras P., 4,449,754, Cl. 299-21.000.

VSL Corporation: *See*—
Davis, Edgar A., 4,449,857, Cl. 405-286.000.

W. Haking Enterprises Limited: *See*—
Wong, Wan C.; and Oshima, Shigeru, 4,449,806, Cl. 354-121.000.

W. R. Grace & Co.: *See*—
Cogliano, Joseph A., 4,450,192, Cl. 428-40.000.
Jachimowicz, Felek, 4,450,246, Cl. 521-129.000.

Wabash, Inc.: *See*—
Wolf, Ronald J.; Jereb, Richard F.; and Parmer, Mark, 4,449,497, Cl. 123-335.000.

Wachter, Anton: *See*—
Mathis, Paul; and Wachter, Anton, 4,449,826, Cl. 366-13.000.

Wachter, Gerhard: *See*—
Sauer, Heinz; Stichel, Willi; and Wachter, Gerhard, 4,449,429, Cl. 81-9.300.
Wachter KG Baustoffwerk: *See*—
Mathis, Paul; and Wachter, Anton, 4,449,826, Cl. 366-13.000.
Waco Beton B.V.: *See*—
Wolters, Tjako A.; and Roggekamp, Aloysius G., 4,449,720, Cl. 277-207.00A.
Wacyk, Ihor T.; and Stewart, Roger G., to RCA Corporation. Two level parity error correction system. 4,450,562, Cl. 371-51.000.
Wadkin plc: *See*—
Colton, Peter M., 4,449,556, Cl. 144-230.000.
Wadsworth, Donald H.: *See*—
Fletcher, George L.; and Wadsworth, Donald H., 4,450,093, Cl. 252-182.000.
Wagner, Ludwig: *See*—
Knabel, Walter; Wagner, Ludwig; and Richert, Manfred, 4,449,731, Cl. 280-632.000.
Wagoner, Max A.: *See*—
Mays, Charles D.; Wagoner, Max A.; and Williard, Daniel G., 4,449,541, Cl. 131-302.000.
Walker, Robert R.: *See*—
Russell, Thomas D.; and Walker, Robert R., 4,450,363, Cl. 290-40.00C.
Walker, Wolfram H.; Ganshirt, Karl H.; and Schleussner, Hans, to Biotest-Serum-Institut GmbH. Microfiltration device for the filtration of coagula and microaggregates from blood. 4,450,078, Cl. 210-315.000.
Wallach, Walter A., Jr.: *See*—
Pilat, John F.; Richmond, Michael S.; Wallach, Walter A., Jr.; and Schleimer, Stephen I., 4,450,522, Cl. 364-200.000.
Walsh, John: *See*—
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Walter Sarstedt Kunstoff-Spritzgusswerk: *See*—
Sarstedt, Walter, 4,449,539, Cl. 128-764.000.
Walther, Karl-Heinz: *See*—
Staffer, Julius; Walther, Karl-Heinz; and Jahn, Hans-Georg, 4,449,453, Cl. 101-416.00A.
Wang, Taylor G.; Elleman, Daniel D.; and Kendall, James M., Jr., to California Institute of Technology. Apparatus for forming a continuous lightweight multicell material. 4,449,901, Cl. 425-6.000.
Wangermann, Klaus: *See*—
Schmidt, Manfred; Wank, Joachim; Reese, Eckart; Freitag, Dieter; Wangermann, Klaus; and Cohnen, Wolfgang, 4,450,249, Cl. 524-132.000.
Wank, Joachim: *See*—
Schmidt, Manfred; Wank, Joachim; Reese, Eckart; Freitag, Dieter; Wangermann, Klaus; and Cohnen, Wolfgang, 4,450,249, Cl. 524-132.000.
Warabi, Junichi: *See*—
Yanagisawa, Hifumi; Warabi, Junichi; and Kashiwagi, Yoshiyuki, 4,450,327, Cl. 200-144.00B.
Warner, Charles E., to Milliken Research Corporation. Continuous A.C. tension control. 4,449,356, Cl. 57-284.000.
Warner, Charles E.: *See*—
Moore, James R.; and Warner, Charles E., 4,449,354, Cl. 57-284.000.
Moore, James R.; Schroder, William J.; Warner, Charles E.; and Pittman, Edgar H., 4,449,355, Cl. 57-284.000.
Warner, Michael J., to Myers Electric Products Inc. Power outlet facility. 4,450,503, Cl. 361-356.000.
Warren, Harold C.: *See*—
Mattes, Kenneth C.; and Warren, Harold C., 4,450,222, Cl. 430-220.000.
Warshaw, Thelma G. Method and compositions for treating acne. 4,450,175, Cl. 424-349.000.
Wasco Products, Inc.: *See*—
Jentoft, Arthur P.; and Couture, Paul A., 4,449,340, Cl. 52-200.000.
Watanabe, Asao: *See*—
Kitamura, Takashi; Watanabe, Asao; Nakano, Takashi; Masaki, Katsumi; Hirayama, Kazuhiro; Sato, Yasushi; and Tokiwa, Taisuke, 4,450,453, Cl. 346-108.000.
Watanabe, Tadaaki; and Tanaka, Yoshio, to Clarion Co., Ltd. Operating shaft mechanism in a pushbutton tuner. 4,449,955, Cl. 464-78.000.
Watanabe, Toshio: *See*—
Takagi, Satoshi; Watanabe, Toshio; and Ito, Masao, 4,450,491, Cl. 360-96.500.
Watanabe, Yoshitaka; and Kazumi, Jiro, to Canon Kabushiki Kaisha. Interval timer device. 4,449,804, Cl. 354-418.000.
Watanabe, Yutaka, to Fuji Xerox Co., Ltd. Data stamp device for automatic printing apparatus of copier. 4,449,449, Cl. 101-111.000.
Waterman, Roger S. Thermocouple assembly. 4,450,315, Cl. 136-230.000.
Watkins, James D., to Golden Valley Foods Inc. Package for increasing the volumetric yield of microwave cooked popcorn. 4,450,180, Cl. 426-107.000.
Watrous, Robert B., to International Business Machines Corporation. Magnetic head slider and actuator assembly. 4,450,493, Cl. 360-106.000.
Watts, Lewis W., Jr.: *See*—
Sanderson, John R.; Watts, Lewis W., Jr.; and Brader, Walter H., Jr., 4,450,290, Cl. 560-246.000.
Wavin B.V.: *See*—
Ettema, Ernst; Benraad, Coenraad J. B. M.; and Roskam, Klaas, 4,450,132, Cl. 264-328.800.
Leloux, Arnoldus W. J., 4,449,910, Cl. 425-325.000.
Weaver, Charles S., to SRI International. Method and apparatus for digital data compression. 4,449,536, Cl. 128-696.000.
Weber, Steven A.: *See*—
Sauerwein, William D.; Sides, Daniel H.; Weber, Steven A.; and Horney, James R., 4,449,329, Cl. 51-168.000.
Weck, Franz, to H. Krantz GmbH & Co. Shutter device for air conduit or the like. 4,449,549, Cl. 137-512.100.
Weeks, James B., to Motor Wheel Corporation. Tracked vehicle road wheel. 4,449,756, Cl. 301-37.00P.
Wehner, Donald R.; and Prickett, Michael J., to United States of America, Navy. Stepped frequency radar target imaging. 4,450,444, Cl. 343-5.0CM.
Wehr, Hubert, to Cyklop International Emil Hoffmann KG, DEX. Apparatus for banding parcels and the like. 4,450,032, Cl. 156-353.000.
Weide, Joachim: *See*—
Diery, Helmut; Deubel, Reinhold; and Weide, Joachim, 4,450,304, Cl. 568-609.000.
Weidler, Charles H., to AMP Incorporated. Connector assembly having improved keying and latching system. 4,449,767, Cl. 339-17.0LC.
Weinberg, Murray: *See*—
Steensma, Peter D.; Weinberg, Murray; Smid, Robert W.; and Finley, Thomas E., 4,450,554, Cl. 370-4.000.
Weingartner, Ernst; and Samietz, Klaus, to Leybold-Heraeus GmbH. Vacuum arc melting and casting furnace with a vacuum chamber and a tilting crucible. 4,450,570, Cl. 373-69.000.
Weiss, Armin K.: *See*—
Reithel, Raymond F.; and Weiss, Armin K., 4,450,215, Cl. 430-7.000.
Weiss, Peter A. Dental electrosurgery electrodes and method of use. 4,449,926, Cl. 433-32.000.
Weissman, Bernard, to Ipco Corporation. Dental anchor. 4,449,937, Cl. 433-225.000.
Wellhoefer, Felicitas; Stacey, David W., deceased; and by Stacey, Lesley A., legal representative, to Lucas Industries Limited. Semiconductor power device assembly and method of manufacture thereof. 4,450,471, Cl. 357-80.000.
Welis, Frank E. Mouthpiece for woodwind instruments. 4,449,439, Cl. 84-383.00R.
Welsh, Jay Y., to Chemetals Incorporated. Preparation of manganite, MnOOH. 4,450,148, Cl. 423-605.000.
Wember, Kurt: *See*—
Fischer, Lothar; Hausen, Manfred Z.; and Wember, Kurt, 4,450,300, Cl. 568-462.000.
Wendel, Wendel R., to Space Structures International Corp. Octa hub. 4,449,843, Cl. 403-173.000.
West, Arthur C., to Minnesota Mining and Manufacturing Company. Fluoropolymer gum of vinylidene fluoride, hexafluoropropene, and bromodifluoroethylene. 4,450,263, Cl. 526-249.000.
Westberg, J. Eric H.; and Unger, H. Peter O., to Separex Teknik AB. Decanting centrifuge. 4,449,964, Cl. 494-16.000.
Westinghouse Canada: *See*—
Bignell, Allan M., 4,450,497, Cl. 361-82.000.
Westinghouse Electric Corp.: *See*—
Bepko, Stephen J., 4,450,563, Cl. 372-23.000.
Clancy, Steven J.; and Phillips, Robert A., 4,450,446, Cl. 343-7.700.
Coviello, John W., 4,450,483, Cl. 358-166.000.
Draper, Robert; Lackey, Robert S.; Fagan, Thomas J., Jr.; Veyo, Stephen E.; and Humphrey, Joseph R., 4,449,376, Cl. 62-259.100.
Draper, Robert, 4,449,377, Cl. 62-324.100.
McAllister, Dan R., 4,449,441, Cl. 89-8.000.
Westner, Andrew A.: *See*—
Oswald, Alexis A.; Jermansen, Torris G.; Westner, Andrew A.; and Huang, I-Der, 4,450,299, Cl. 568-454.000.
Westvaco Corporation: *See*—
Schilling, Peter; and Schreuders, Hans G., 4,450,011, Cl. 106-269.000.
Weterings, Cornelis A.M.; and Janssen, Johannes A., to Stamicarbon B.V. Process for recovering a uranium-containing concentrate and purified phosphoric acid. 4,450,142, Cl. 423-8.000.
Weyde, Edith; von Rintelen, Harald; Saleck, Wilhelm; and Teitscheid, Heinz-Horst, to Agfa-Gevaert Aktiengesellschaft. Silver halide emulsion prepared by converting silver phosphate. 4,450,225, Cl. 430-567.000.
Weyerhaeuser Company: *See*—
Dooley, James H., 4,449,642, Cl. 221-211.000.
Whatley, Roger A., to Motorola, Inc. Delta V_{BE} bias current reference circuit. 4,450,367, Cl. 307-297.000.
Wheeler, Glynn P.: *See*—
Temple, Carroll G., Jr.; Montgomery, John A.; Elliott, Robert D.; and Wheeler, Glynn P., 4,450,160, Cl. 424-250.000.
Whirlpool Corporation: *See*—
Cartier, Roger J., 4,449,383, Cl. 68-12.00R.
Lampman, William T., 4,449,765, Cl. 312-311.000.
Whitaker, Brackston T. Swimming pool cleaning method and apparatus. 4,449,260, Cl. 4-490.000.
White, Daniel S.; and Nave, Jerald L. Pulmonary resuscitator. 4,449,525, Cl. 128-203.110.
White, George R., to Smith Kline & French Laboratories Limited. Pyrimidone salt and its preparation. 4,450,161, Cl. 424-251.000.
White, John C.: *See*—
Janes, Timothy W.; and White, John C., 4,449,285, Cl. 29-571.000.
White, Roger P., to U.S. Philips Corporation. Construction of an epid bar graph. 4,450,440, Cl. 340-753.000.

Whittam, Thomas V.: *See—*
Lake, Ivan J. S.; and Whittam, Thomas V., 4,450,312, Cl. 585-481.000.

Wiechert, Rudolf: *See—*
Nickisch, Klaus; Laurent, Henry; Wiechert, Rudolf; and Casals-Stenzel, Jorge, 4,450,107, Cl. 424-238.000.

Wiegand, Karl-Wolfram, to Dimter GmbH Maschinenfabrik. Method and apparatus for trimming wooden boards. 4,449,558, Cl. 144-367.000.

Wieland, Michael S.: *See—*
Buckley, Michael E.; Tschirn, Thomas N.; McClure, Donald R.; and Wieland, Michael S., 4,449,458, Cl. 102-430.000.

Wierschem, Franz-Rudolf: *See—*
Langwieder, Rolf; Rebmann, Rolf; Stotz, Erich; Wierschem, Franz-Rudolf; and Trick, Fred, 4,449,603, Cl. 180-232.000.

Wiese, Kurt: *See—*
Lubecki, Andrzej; Wiese, Kurt; and Winkler, Karl, 4,450,576, Cl. 378-47.000.

Wigley, David L.: *See—*
Tucker, Jeffrey C.; Edmundson, H. Dale; Wigley, David L.; and Vallo, Mark F., 4,449,393, Cl. 73-40.000.

Wilhelm, Volker: *See—*
Messer, Dieter; Wilhelm, Volker; Endres, Robert; and Heine, Heinrich, 4,450,012, Cl. 106-300.000.

Wilkens, Christian, to Karl Mayer Textilmaschinenfabrik GmbH. Warp knitted fabric and process for its production. 4,449,380, Cl. 66-84.00A.

Willard, Alvin K.: *See—*
Hoffman, William F.; Smith, Robert L.; and Willard, Alvin K., 4,450,171, Cl. 424-279.000.

Williams, Alan E.; and Gibbs, Andrew R. Heating device and method of heating articles. 4,449,925, Cl. 432-225.000.

Williams, Errol R.: *See—*
Goff, Willie, Jr.; Rakes, James M.; and Williams, Errol R., 4,450,342, Cl. 219-216.000.

Williams, Gerald J. Varying geometric compression ratio engine. 4,449,489, Cl. 123-48.00R.

Williams, Paul, to Accuray Corporation. Sheet property sensor with sheet wrinkle remover. 4,449,398, Cl. 73-159.000.

Williams, Paul; and Landis, Dan R., to Accuray Corporation. Pneumatic surface follower with negative feedback of a variable force counteracting the levitating force. 4,450,404, Cl. 324-226.000.

Williamson, Gerald E., to Yetter Manufacturing Co. Row marker arm assembly. 4,449,590, Cl. 172-126.000.

Williard, Daniel G.: *See—*
Maya, Charles D.; Wagoner, Max A.; and Williard, Daniel G., 4,449,541, Cl. 131-302.000.

Willis, Chester R., to Hercules Incorporated. Peroxide blends. 4,450,302, Cl. 502-150.000.

Wilson, David A. Adjustable speaker system and method of adjustment. 4,450,322, Cl. 179-146.00E.

Wilson, Joe C.; and Hirozawa, Stanley T., to BASF Wyandotte Corporation. Corrosion inhibited alcohol compositions. 4,450,088, Cl. 252-75.000.

Wilson, John R.: *See—*
Radosay, Jon J.; and Wilson, John R., 4,449,719, Cl. 277-192.000.

Wilson Jones Company: *See—*
Semerjian, Joseph K.; and Lodge, Glenn R., 4,449,436, Cl. 83-571.000.

Wilson, Kermit H.; and Bue, Richard C., to Sico Incorporated. Powered folding support structure. 4,449,263, Cl. 5-133.000.

Winderlich, Hans-Georg: *See—*
Stockburger, Hermann; and Winderlich, Hans-Georg, 4,450,348, Cl. 235-380.000.

Winkler, Karl: *See—*
Lubecki, Andrzej; Wiese, Kurt; and Winkler, Karl, 4,450,576, Cl. 378-47.000.

Winslow, Edward H., III: *See—*
Gilbride, Andrew J.; Malecki, Edward S.; Winslow, Edward H., III; and Coleman, Robert F., 4,449,463, Cl. 112-121.260.

Winter, Johann: *See—*
Kohl, Karl, 4,449,381, Cl. 66-203.000.
Kohl, Karl, 4,449,382, Cl. 66-203.000.

Witte, Hans H., to Siemens Aktiengesellschaft. Optical star coupler with a planar mixer element. 4,449,783, Cl. 350-96.160.

Wittkamper, Johannes M.: *See—*
Holster, Peter L.; and Wittkamper, Johannes M., 4,450,553, Cl. 369-275.000.

Wixon, Harold E., to Colgate Palmolive Company. Detergent softener compositions. 4,450,085, Cl. 252-8.750.

Wohlford, William P.; and Beitel, Howard V., to Deere & Company. Sprocket receptacle cleaner embodied in a track section. 4,449,758, Cl. 305-12.000.

Wolcott, Bernard F.: *See—*
Scales, John M.; and Wolcott, Bernard F., 4,449,847, Cl. 405-19.000.

Wolf, Ronald J.; Jereb, Richard F.; and Farmer, Mark, to Wabash, Inc. Capacitor discharge ignition system. 4,449,497, Cl. 123-335.000.

Wollenberg, Robert H., to Chevron Research Company. Process for the preparation of a polyalkenyl succinic anhydride. 4,450,281, Cl. 549-255.000.

Wollenschlager, Werner, to Draloric Electronic GmbH. Electric capacitor of variable capacitance. 4,450,500, Cl. 361-277.000.

Wolters, Tjako A.; and Roggekamp, Aloysius G., to Ballast-Nedam Groep N.V.; and Waco Beton B.V. Watertight seal between two concrete elements. 4,449,720, Cl. 277-207.00A.

Wong, Boon: *See—*
Peters, Thomas E.; Gustafson, John C.; and Wong, Boon, 4,450,135, Cl. 419-12.000.

Wong, Wan C.; and Oshima, Shigeru, to W. Haking Enterprises Limited. Film advance mechanism for disc camera. 4,449,806, Cl. 354-121.000.

Woo, Edmund P.; and Murray, Daniel J., to Dow Chemical Company, The. Preparation of esters. 4,450,285, Cl. 560-206.000.

Woolaver, Dennis A.; and Baitis, A. Erich, to United States of America, Navy. Mechanical clutch/decoupler for hydraulic pumps. 4,449,469, Cl. 114-150.000.

Wouden, Adriaan v. d., to Industri AB Thule. Load carrier for vehicles. 4,449,656, Cl. 224-320.000.

Wreford, Stanley S., to Du Pont de Nemours, E. I., and Company. Process for converting nitriles to carboxylic esters. 4,450,112, Cl. 260-410.90R.

Wright, Bernard S.; Owen, Hartley; and Hsia, Chung H., to Mobil Oil Corporation. Heat exchange technique for olefin fractionation and catalytic conversion system. 4,450,311, Cl. 585-413.000.

Wright, Ralph W.: *See—*
Kauffman, William J.; and Wright, Ralph W., 4,450,194, Cl. 428-172.000.

Wu, Margaret M.: *See—*
Forbus, Nancy P.; and Wu, Margaret M., 4,449,961, Cl. 585-640.000.

Wu, Wen-Yu. Nursing bottle with disposable insert. 4,449,636, Cl. 215-11.00E.

Wullschleger, Manfred J.: *See—*
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Xerox Corporation: *See—*
Abreu, Cristian O., 4,449,808, Cl. 355-3.0TR.
Araghi, Mehdi N.; and Daniele, Joseph J., 4,450,458, Cl. 346-155.000.
Scifres, Donald R.; Streifer, William; and Burnham, Robert D., 4,450,567, Cl. 372-50.000.
Spehrley, C. W., Jr., 4,449,661, Cl. 227-155.000.
Turner, William D.; and Sprague, Robert A., 4,450,459, Cl. 346-160.000.

Xicor, Inc.: *See—*
Owen, William H., III, 4,450,402, Cl. 324-73.00R.

Yaegashi, Takehisa; Aoki, Keiji; and Hashikawa, Kenzo, to Toyota Jidosha Kogyo Kabushiki Kaisha. Method and apparatus for controlling the operation of an internal combustion engine. 4,450,528, Cl. 364-431.050.

Yaguchi, Svetlana: *See—*
Andreini, Rockne J.; Farmer, Audley J.; and Yaguchi, Svetlana, 4,450,008, Cl. 75-128.00A.

Yamada, Hideo: *See—*
Koizumi, Hideaki; Yamada, Hideo; and Oishi, Kounosuke, 4,449,820, Cl. 356-307.000.

Yamada, Kenji, to Nippon Kogaku K.K. Imaging optical system. 4,449,794, Cl. 350-472.000.

Yamada, Masanori; and Hiramatsu, Akira, to Canon Kabushiki Kaisha. Indicating apparatus for electronic flash system of TTL light measurement type. 4,449,803, Cl. 354-416.000.

Yamada, Noboru, to Tokyo Shibaura Denki Kabushiki Kaisha. Printing head for wire dot printer. 4,449,836, Cl. 400-124.000.

Yamada, Takahiro, to Matsushita Electric Industrial Co., Ltd. Solid state area imaging apparatus having a charge transfer arrangement. 4,450,464, Cl. 357-30.000.

Yamada, Takeyoshi; Kurisu, Shizuka; Azuma, Shizuo; Kawase, Shoji; and Sano, Makoto, to Teijin Limited. Heat-and-moisture exchanger. 4,449,992, Cl. 55-158.000.

Yamada, Tetsuyo; and Nakayama, Yutaka, to NGK Spark Plug Co., Ltd. Oxygen sensor. 4,450,065, Cl. 204-412.000.

Yamada, Toshikatsu, to k. k. Yamada Kogaku Seisakusho. Stereoscope with tongue and grooves. 4,449,795, Cl. 350-516.000.

Yamagata, Norio: *See—*
Tani, Tatsuo; Sawata, Sinji; Tanaka, Tadayoshi; Sakuta, Koichi; Nakamoto, Yasunobu; Sekiya, Hideshi; Morita, Masanobu; and Yamagata, Norio, 4,449,517, Cl. 126-435.000.

Yamaguchi, Katsumi: *See—*
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Yamaguchi, Kazuo; Kuni, Asahiro; Akiyama, Nobuyuki; and Endo, Juro, to Hitachi Metals, Ltd. Method of inspecting microscopic surface defects. 4,449,818, Cl. 356-237.000.

Yamaguchi Kikai Kogyo Co., Ltd.: *See—*
Tokoro, Takehiko; Kashima, Shoichi; and Murata, Mineo, 4,449,856, Cl. 405-269.000.

Yamaha Hatsudoki Kabushiki Kaisha: *See—*
Tezuka, Etsuhiro; Kaji, Koichiro; and Ichinose, Toru, 4,449,505, Cl. 123-447.000.

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Yamamoto, Ryoichi: *See—*
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Yamamoto, Setsuo: *See—*
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Yamamoto, Takeski, to Mitsubishi Denki Kabushiki Kaisha. Mesa type semiconductor device with guard ring. 4,450,469, Cl. 357-56.000.
Yamashita, Masaaki: *See*—
Hara, Tomihiro; Ogawa, Masahiro; and Yamashita, Masaaki, 4,450,209, Cl. 428-626.000.
Yamazaki, Takeo: *See*—
Miyoshi, Tadahiko; Yamazaki, Takeo; Maeda, Kunihiro; Takahashi, Ken; and Oowada, Siniti, 4,450,426, Cl. 338-21.000.
Yanagawa, Nobuyuki: *See*—
Ikesue, Masumi; and Yanagawa, Nobuyuki, 4,449,810, Cl. 355-3.0DD.
Yanagi, Kouichiro, to Akebono Brake Industry Company, Ltd. Brake piston of disk type. 4,449,447, Cl. 92-248.000.
Yanagisawa, Hifumi; Warahi, Junichi; and Kashiwagi, Yoshiyuki, to Kabushiki Kaisha Meidensha. Vacuum interrupter. 4,450,327, Cl. 200-144.00B.
Yanagishima, Takayuki: *See*—
Seko, Yasutoshi; Yanagishima, Takayuki; and Fukasawa, Noburu, 4,450,438, Cl. 340-576.000.
Yankovoy, Alexander; and Ozer, Theodore, to Boeing Company, The. Method and tool for generating countersunk holes in composite materials. 4,449,865, Cl. 408-1.00R.
Yasumatsu, Jun; Mori, Mamoru; Nishiwaki, Toshihito; and Owada, Akira, to Toyota Jidosha Kogyo Kabushiki Kaisha. Vehicle seat position control mechanism with neutral memory. 4,449,752, Cl. 297-341.000.
Yasumura, Motoaki: *See*—
Ashizawa, Takeshi; and Yasumura, Motoaki, 4,449,699, Cl. 266-58.000.
Hayasaki, Hidehiko; and Yasumura, Motoaki, 4,450,014, Cl. 148-9.00R.
Yasunaga, Toshio: *See*—
Miyazaki, Yoshiro; Yasunaga, Toshio; and Sasaki, Tomiya, 4,449,579, Cl. 165-104.330.
Yazawa, Kouzou: *See*—
Hayashi, Keijiro; Awano, Toshimi; Yoshikawa, Masayuki; Yazawa, Kouzou; and Ito, Takashi, 4,449,707, Cl. 273-171.000.
Yazawa, Yukichi: *See*—
Hotta, Kouichi; Yazawa, Yukichi; and Tatsukawa, Osami, 4,450,345, Cl. 219-491.000.
Yetter Manufacturing Co.: *See*—
Williamson, Gerald E., 4,449,590, Cl. 172-126.000.
Yokko, Masao: *See*—
Mokuya, Hiroichi; Yokko, Masao; Komatsu, Hiroyuki; Suzuki, Katsuhisa; and Kitayama, Takeo, 4,449,496, Cl. 123-198.00F.
Yokoyama, Katsunori: *See*—
Takikawa, Osamu; Katsura, Masaki; Tanuma, Chiaki; and Yokoyama, Katsunori, 4,449,919, Cl. 431-76.000.
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Nakamura, Masahiko; and Yokoyama, Takashi, 4,449,430, Cl. 81-98.000.
Yonezawa, Keitaro; and Utsumi, Tadao, to Aioi Seiki Kabushiki Kaisha. Dies exchanging device for a machine using dies. 4,449,907, Cl. 425-183.000.
Yonezawa, Masatomo: *See*—
Miyamoto, Haruhiko; and Yonezawa, Masatomo, 4,450,240, Cl. 501-136.000.
Yoo, Sung-eun, to Du Pont de Nemours, E. I., and Company. Antihypertensive polyhalohydroxyisopropyl phenylalka(e)noic acid esters of alkylaminohydroxypropyloxyphenylalkyl alcohols. 4,450,172, Cl. 424-309.000.
Yoritaka, Masashi: *See*—
Satou, Kazuo; and Yoritaka, Masashi, 4,450,019, Cl. 148-35.000.
Yoshida, Takao, to International Flavors & Fragrances Inc. Process for the production of arylalkanone and intermediate. 4,450,296, Cl. 568-316.000.
Yoshida, Toshio; Matsui, Shigetomo; and Atsuta, Toshio, to Kawasaki Jukogyo Kabushiki Kaisha. Method of producing multiple-wall, composite tubular structures. 4,449,281, Cl. 29-421.00R.
Yoshikawa, Masayuki: *See*—
Hayashi, Keijiro; Awano, Toshimi; Yoshikawa, Masayuki; Yazawa, Kouzou; and Ito, Takashi, 4,449,707, Cl. 273-171.000.
Yoshikumi, Chikao; Ohmura, Yoshio; Hirose, Fumio; Ikuzawa, Masanori; Matsunaga, Kenichi; Fujii, Takayoshi; Ohhara, Minoru; and Ando, Takao. Pharmaceutical composition containing a derivative of ortho-aminobenzoic acid as an active ingredient. 4,450,156, Cl. 424-180.000.
Yoshino, Masataka; Hashimoto, Yoshiki; and Ushikosi, Yasunori, to Mitsubishi Denki Kabushiki Kaisha. Ventilation device. 4,449,574, Cl. 165-11.00R.
Yoshitomi Pharmaceutical Industries, Ltd.: *See*—
Araki, Kazuhiko; Ao, Hideki; Kimura, Tomohiko; and Aihara, Kenichi, 4,450,165, Cl. 424-258.000.
Arimura, Katsuo; Murakami, Shu; and Oka, Taichi, 4,450,275, Cl. 548-201.000.
Young, Colin G., to Emco Wheaton (International) Limited. Gaseous fuel carburetion. 4,449,509, Cl. 123-527.000.
Young, Herbert L.: *See*—
Simmons, Ronald L.; and Young, Herbert L., 4,450,110, Cl. 260-349.000.
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Salvucci, Orfeo J.; Hobby, John M.; Hennessy, James J.; and Young, Ronald R., 4,450,039, Cl. 156-504.000.
Younger, Gilbert W. Laminated separator plate means for recalibrating automatic transmissions. 4,449,426, Cl. 74-867.000.
Yuan, Raymond C.: *See*—
Stahl, Howard D.; and Yuan, Raymond C., 4,450,182, Cl. 426-565.000.
Yuasa, Katsumi: *See*—
Mimura, Akio; Yuasa, Katsumi; and Shibukawa, Mitsuru, 4,450,233, Cl. 435-178.000.
Yuasa, Yoshio; and Naruse, Kazuhiko, to Minolta Camera Kabushiki Kaisha. Exposure indicator. 4,449,822, Cl. 356-227.000.
Yum, Lawrence H.; and Chen, Fu-Chuan, to Hughes Aircraft Company. Stripline-type power divider/combiner with integral resistor and method of making the same. 4,450,418, Cl. 333-128.000.
Zebker, Howard A.; Held, Daniel N.; Goldstein, Richard M.; and Bickler, Thomas C., to United States of America, National Aeronautics and Space Administration. Synthetic aperture radar target simulator. 4,450,447, Cl. 343-17.700.
Zee Toys, Inc.: *See*—
Fisher, David R., 4,449,323, Cl. 46-211.000.
Zenith Radio Corporation: *See*—
Lehnert, Stanley E., 4,450,386, Cl. 315-371.000.
Zeysolff, Edmond: *See*—
Schmidts, Kurt; Schuett, Walter; Zeysolff, Edmond; and Saumer, Wilhelm, 4,449,914, Cl. 425-556.000.
Zodrow, Rodolf; and Buchholz, Rainer, to Jagenberg AG. Noise-proofed labeling machine. 4,450,040, Cl. 156-567.000.
Zoltan, Bozso: *See*—
Bela, Batyi; Geza, Gulyas; Zoltan, Bozso; Istvan, Csakany; and Janos, Bartucz, 4,449,4[illegible], Cl. 110-214.000.
Zuckert, Bertram: *See*—
Behmel, Lukas K.; and Zuckert, Bertram, 4,450,257, Cl. 525-437.000.
Zuckler, Karl, to Siemens Aktiengesellschaft. Electric switch with two quenching nozzles having an improved quenching medium flow. 4,450,330, Cl. 200-148.00A.
Zullig, Heinz, to Bucher-Guyer AG. Method of and arrangement for manufacturing enclosed blocks. 4,449,905, Cl. 425-117.000.
Zwaskis, William J.: *See*—
Cerwin, Robert J.; Joshi, Madhusudan; Menges, John R.; Mericle, Robert W.; and Zwaskis, William J., 4,449,531, Cl. 128-325.000.
Zychowski, Edwin A.; and Richards, Ronald L., to DeSoto, Inc. Thermosetting aqueous varnish compositions. 4,450,251, Cl. 524-251.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 22ND DAY OF MAY, 1984

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

ARCHIFAR Laboratori Chimico Farmacologici S.p.A.: *See*—
Marsili, Leonardo; and Pasqualucci, Carmine, Re. 31,587, Cl. 260-239.30P.

Bristol-Myers Company: *See*—
Crenshaw, Ronnie R.; and Luke, George M., Re. 31,588, Cl. 548-342.000.

Crenshaw, Ronnie R.; and Luke, George M., to Bristol-Myers Company. Imidazolylmethylthioethyl alkynyl guanidines. Re. 31,588, Cl. 548-342.000.

Foseco Trading A.G.: *See*—
Phoenix, Richard C.; and Jago, Edward J., Re. 31,589, Cl. 75-27.000.

Jago, Edward J.: *See*—
Phoenix, Richard C.; and Jago, Edward J., Re. 31,589, Cl. 75-27.000.

Luke, George M.: *See*—
Crenshaw, Ronnie R.; and Luke, George M., Re. 31,588, Cl. 548-342.000.

Marsili, Leonardo; and Pasqualucci, Carmine, to ARCHIFAR Laboratori Chimico Farmacologici S.p.A. Process for the preparation of 3-iminomethyl derivatives of rifamycin SV. Re. 31,587, Cl. 260-239.30P.

Pasqualucci, Carmine: *See*—
Marsili, Leonardo; and Pasqualucci, Carmine, Re. 31,587, Cl. 260-239.30P.

Phoenix, Richard C.; and Jago, Edward J., to Foseco Trading A.G. Thermal insulation molten metal. Re. 31,589, Cl. 75-27.000.

LIST OF REEXAMINATION PATENTEES

TO WHOM

CERTIFICATES WERE ISSUED

Aoki, Shingi: *See*—
Machi, Sueo; Kawamura, Keita; Kawakami, Waichiro; Aoki, Shingi; Hashimoto, Shoji; Keiichi, Yotumoto; and Sunaga, Hiromi, B1 3,869,362, Cl. 204-157.10R.

Asahi Glass Co., Ltd.: *See*—
Oda, Yoshio; Suhara, Manabu; and Endo, Eiji, B1 4,065,366, Cl. 204-98.000.

Baker Perkins Inc.: *See*—
Loomans, Bernard A.; and Brennan, Ambrose K., Jr., B1 3,195,868, Cl. 366-85.000.

Brennan, Ambrose K., Jr.: *See*—
Loomans, Bernard A.; and Brennan, Ambrose K., Jr., B1 3,195,868, Cl. 366-85.000.

Campbell, George L., to Syracuse Tank & Manufacturing. Method for producing a helically wound pipe having a predetermined diameter. B1 4,287,739, 5-22-84, Cl. 72-34.000.

Ebara Manufacturing Co., Ltd.: *See*—
Machi, Sueo; Kawamura, Keita; Kawakami, Waichiro; Aoki, Shingi; Hashimoto, Shoji; Keiichi, Yotumoto; and Sunaga, Hiromi, B1 3,869,362, Cl. 204-157.10R.

Endo, Eiji: *See*—
Oda, Yoshio; Suhara, Manabu; and Endo, Eiji, B1 4,065,366, Cl. 204-98.000.

Gasse, Robert W. Apparatus for the production of duplicate, and other films from original films. B1 4,265,533, 5-22-84, Cl. 355-110.000.

Green, Philip S., to Stanford Research Institute. Ultrasonic imaging method and apparatus. B1 4,016,750, 5-22-84, Cl. 73-629.000.

Hashimoto, Shoji: *See*—
Machi, Sueo; Kawamura, Keita; Kawakami, Waichiro; Aoki, Shingi; Hashimoto, Shoji; Keiichi, Yotumoto; and Sunaga, Hiromi, B1 3,869,362, Cl. 204-157.10R.

Japan Atomic Energy Research Institute: *See*—
Machi, Sueo; Kawamura, Keita; Kawakami, Waichiro; Aoki, Shingi; Hashimoto, Shoji; Keiichi, Yotumoto; and Sunaga, Hiromi, B1 3,869,362, Cl. 204-157.10R.

Kawakami, Waichiro: *See*—
Machi, Sueo; Kawamura, Keita; Kawakami, Waichiro; Aoki, Shingi; Hashimoto, Shoji; Keiichi, Yotumoto; and Sunaga, Hiromi, B1 3,869,362, Cl. 204-157.10R.

Kawamura, Keita: *See*—
Machi, Sueo; Kawamura, Keita; Kawakami, Waichiro; Aoki, Shingi; Hashimoto, Shoji; Keiichi, Yotumoto; and Sunaga, Hiromi, B1 3,869,362, Cl. 204-157.10R.

Keiichi, Yotumoto: *See*—
Machi, Sueo; Kawamura, Keita; Kawakami, Waichiro; Aoki, Shingi; Hashimoto, Shoji; Keiichi, Yotumoto; and Sunaga, Hiromi, B1 3,869,362, Cl. 204-157.10R.

Littleton, F. John, to World Color Press, Inc. Sheeter for use with printing press and adding provision for arresting, squaring and diverting of sheet. B1 3,994,221, 5-22-84, Cl. 101-227.000.

Loomans, Bernard A.; and Brennan, Ambrose K., Jr., to Baker Perkins Inc. Continuous mixer. B1 3,195,868, 5-22-84, Cl. 366-85.000.

Machi, Sueo; Kawamura, Keita; Kawakami, Waichiro; Aoki, Shingi; Hashimoto, Shoji; Keiichi, Yotumoto; and Sunaga, Hiromi, to Ebara Manufacturing Co., Ltd.; and Japan Atomic Energy Research Institute. Process for removing noxious gas pollutants from effluent gases by irradiation. B1 3,869,362, 5-22-84, Cl. 204-157.10R.

Oda, Yoshio; Suhara, Manabu; and Endo, Eiji, to Asahi Glass Co., Ltd. Process for producing alkali metal hydroxide. B1 4,065,366, 5-22-84, Cl. 204-98.000.

Stanford Research Institute: *See*—
Green, Philip S., B1 4,016,750, Cl. 73-629.000.

Suhara, Manabu: *See*—
Oda, Yoshio; Suhara, Manabu; and Endo, Eiji, B1 4,065,366, Cl. 204-98.000.

Sunaga, Hiromi: *See*—
Machi, Sueo; Kawamura, Keita; Kawakami, Waichiro; Aoki, Shingi; Hashimoto, Shoji; Keiichi, Yotumoto; and Sunaga, Hiromi, B1 3,869,362, Cl. 204-157.10R.

Syracuse Tank & Manufacturing: *See*—
Campbell, George L., B1 4,287,739, Cl. 72-34.000.

World Color Press, Inc.: *See*—
Littleton, F. John, B1 3,994,221, Cl. 101-227.000.

LIST OF DESIGN PATENTEES

Abbott Laboratories: *See*—
Brueck, Daniel A.; and Hershey, Charles J., 273,942, Cl. D9-434.000.
Holen, James T.; Becker, Julius S.; and Case, Robert, 273,987, Cl. D24-17.000.

Adams, Harold P.: *See*—
Koeneman, David F.; Adams, Harold P.; and Blee, Robert W., 273,944, Cl. D10-50.000.

Airway Industries, Inc.: *See*—
Davis, Michael, 273,912, Cl. D3-71.000.

Amana Refrigeration, Inc.: *See*—
Stevens, James P.; and Wojtowicz, Chester J., 273,931, Cl. D7-351.000.

American Standard, Inc.: *See*—
Enthoven, Axel, 273,978, Cl. D23-58.000.
Kaiser, Jack N., 273,980, Cl. D23-61.000.
Ruff, Robert O., 273,937, Cl. D8-344.000.
Stair, Henry M., Jr., 273,979, Cl. D23-58.000.

Antonis, Basil: *See*—
Chapman, John M.; and Antonis, Basil, 273,999, Cl. D26-3.000.

Applied Devices Corporation: *See*—
Kummer, Carl P., 273,960, Cl. D16-132.000.

Bailly, Francois, to Equipements Automobiles Marchal S.A. Headlight. 274,000, 5-22-84, Cl. D26-29.000.

Ballantine, Robert K., to BCM Manufacturing Ltd. Flooring unit. 273,998, 5-22-84, Cl. D25-91.000.

Bassey, Karolin M. Multiple greeting card holder. 273,961, 5-22-84, Cl. D19-90.000.

BCM Manufacturing Ltd.: *See*—
Ballantine, Robert K., 273,998, Cl. D25-91.000.

Becker, Julius S.: *See*—
Holen, James T.; Becker, Julius S.; and Case, Robert, 273,987, Cl. D24-17.000.

Bee, James W. M., to Northern Telecom Limited. Attendant console. 273,954, 5-22-84, Cl. D14-58.000.

Bell Telephone Laboratories, Incorporated: *See*—
Brown, Kenneth B., Jr.; Genaro, Donald M.; McGarvey, John N.; and Tilley, Alvin R., 273,955, Cl. D14-60.000.
Genaro, Donald M.; McGarvey, John N.; and Tilley, Alvin R., 273,909, Cl. D14-60.000.

Bennett, Robert. Combined bellows pump and fluid dispensing container. 273,939, 5-22-84, Cl. D9-301.000.

Blee, Robert W.: *See*—
Koeneman, David F.; Adams, Harold P.; and Blee, Robert W., 273,944, Cl. D10-50.000.

Bolster, Gary; and Shepley, Chris, to Neotech International Corporation. Bicycle handgrip. 273,935, 5-22-84, Cl. D8-303.000.

Boswell, Gordon H., to Mason & Porter Limited. Air pump. 273,957, 5-22-84, Cl. D15-9.000.

Brown, Kenneth B., Jr.; Genaro, Donald M.; McGarvey, John N.; and Tilley, Alvin R., to Bell Telephone Laboratories, Incorporated. Telephone stand. 273,955, 5-22-84, Cl. D14-60.000.

Brueck, Daniel A.; and Hershey, Charles J., to Abbott Laboratories. Bottle ferrule. 273,942, 5-22-84, Cl. D9-434.000.

Brunswick Corporation: *See*—
Fee, Robert W., 273,972, Cl. D22-26.000.
Mack, John J., 273,973, Cl. D22-25.000.

Budde, Donald F., to Urethane Roller Specialists, Inc. Swing seat. 273,967, 5-22-84, Cl. D21-246.000.

Burby, Leo J.; and Evans, Henry P. Anti-seasickness belt device. 273,992, 5-22-84, Cl. D24-99.000.

Burrows, Bruce D. Water reservoir for a reverse osmosis system. 273,976, 5-22-84, Cl. D23-2.000.

Burrows, Bruce D. Water reservoir for a reverse osmosis system. 273,977, 5-22-84, Cl. D23-2.000.

Byrns, James E.; and Williams, Samuel W. Combined stadium seat and tray. 273,926, 5-22-84, Cl. D6-201.000.

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34 B1 4,287,739
100 4,449,386
215 4,449,387
381 4,449,388
389 4,449,389
405 4,449,390

CLASS 73

32 R 4,449,391
40 4,449,392
4,449,393
55 4,449,394
56 4,449,395
61.1 R 4,449,396
118 4,449,397
159 4,449,398
4,449,399
189 4,449,400
202 4,449,401
204 4,449,402
295 4,449,403
4,449,404
304 C 4,449,405
433 4,449,406
462 4,449,407
629 B1 4,016,750
643 4,449,408
4,449,411
724 4,449,409
738 4,449,412
780 4,449,413
861.37 4,449,414
861.91 4,449,410

CLASS 74

214 4,449,415
336 R 4,449,416
409 4,449,417
475 4,449,418
493 4,449,419
501 R 4,449,420
516 4,449,421
606 R 4,449,422
688 4,449,423
701 4,449,424
804 4,449,425
867 4,449,426

CLASS 75

0.5 A 4,450,002
10 C 4,450,007
10 R 4,450,003
27 Re.31,589
53 4,450,004
60 4,450,005
125 4,450,006
128 A 4,450,008

CLASS 76

77 4,449,427
104 R 4,449,428

CLASS 81

9.3 4,449,429
98 4,449,430
165 4,449,431

CLASS 82

3 4,449,432

CLASS 83

76 4,449,433
98 4,449,434
167 4,449,435
571 4,449,436

CLASS 84

1.01 4,449,437
310 4,449,438
383 R 4,449,439
422 R 4,449,440

CLASS 89

8 4,449,441

CLASS 91

44 4,449,442
392 4,449,443
506 4,449,444

CLASS 92

12.2 4,449,445
146 4,449,446
248 4,449,447

CLASS 100

153 4,449,448

CLASS 101

111 4,449,449
227 B1 3,994,221
232 4,449,450
350 4,449,451
382 MV 4,449,452
416 A 4,449,453

CLASS 102

226 4,449,454
234 4,449,455
240 4,449,456
251 4,449,457
430 4,449,458

CLASS 104

12 4,449,459

CLASS 106

76 4,450,009
87 4,450,010
269 4,450,011
300 4,450,012
308 N 4,450,013

CLASS 110

214 4,449,460
229 4,449,461
288 4,449,462

CLASS 112

121.26 4,449,463
153 4,449,465
311 4,449,464

CLASS 114

91 4,449,466
103 4,449,467
104 4,449,468
150 4,449,469
4,449,470
249 4,449,471
274 4,449,472
354 4,449,473

CLASS 116

2 4,449,474

CLASS 118

645 4,449,475
674 4,449,476
694 4,449,477
720 4,449,478

CLASS 119

2 4,449,479
4 4,449,480
96 4,449,481

CLASS 122

4 D 4,449,482
4,449,483
13 R 4,449,484
209 R 4,449,485

CLASS 123

41.29 4,449,486
41.34 4,449,487
46 R 4,449,488
48 R 4,449,489
52 A 4,449,494
79 C 4,449,490
90.34 4,449,491
193 CH 4,449,492
196 A 4,449,493
198 DB 4,449,495
198 F 4,449,496
335 4,449,497
339 4,449,498
4,449,499
380 4,449,500
425 4,449,501
440 4,449,502
447 4,449,503
4,449,504
4,449,505
458 4,449,506
467 4,449,507
492 4,449,508
527 4,449,509

CLASS 126

99 A 4,449,510
110 R 4,449,511
292 4,449,512
416 4,449,513
418 4,449,514
430 4,449,515
4,449,516
435 4,449,517

CLASS 128

4 4,449,518
4,449,519
79 4,449,520
4,449,521
200.26 4,449,522
4,449,523
202.27 4,449,524
203.11 4,449,525
206.21 4,449,526
207.17 4,449,527
303.1 4,449,528
314 4,449,529
325 4,449,530
4,449,531
341 4,449,532
494 4,449,533
634 4,449,535
696 4,449,536
723 4,449,537
760 4,449,538
764 4,449,539

CLASS 131

290 4,449,540
302 4,449,541

CLASS 135

98 4,449,542

CLASS 136

230 4,450,314
4,450,315
256 4,450,316

CLASS 137

3 4,449,543
15 4,449,544
68 R 4,449,545
86 4,449,546
330 4,449,547
468 4,449,548
512.1 4,449,549
624.13 4,449,550
625.41 4,449,551

CLASS 138

30 4,449,552
35 4,449,553
149 4,449,554

CLASS 144

198 R 4,449,555
230 4,449,556
357 4,449,557
367 4,449,558

CLASS 145

62 4,449,559

CLASS 148

9 R 4,450,014
4,450,015
11.5 F 4,450,016
4,450,020
16 4,450,017
26 4,450,018
35 4,450,019

CLASS 152

209 R 4,449,560
213 R 4,449,561

CLASS 156

42 4,450,022
64 4,450,023
108 4,450,024
132 4,450,025
164 4,450,026
193 4,450,027
198 4,450,028
250 4,450,029
307.3 4,450,030
345 4,450,031
353 4,450,032
380.8 4,450,033
382 4,450,034
384 4,450,035
4,450,036
441.5 4,450,037
497 4,450,038
504 4,450,039
567 4,450,040
628 4,450,041
643 4,450,042

CLASS 160

113 4,449,562
166 A 4,449,564
184 4,449,563

CLASS 162

5 4,450,043
65 4,450,044
164.3 4,450,045
352 4,449,565

CLASS 164

5 4,449,566
137 4,449,567
453 4,449,568

CLASS 165

1 4,449,569
4,449,571
4,449,572
10 4,449,573
11 R 4,449,574
65 4,449,570
82 4,449,575
104.12 4,449,577
104.33 4,449,576
4,449,578
4,449,579
104.34 4,449,580
151 4,449,581

CLASS 166

64 4,449,582
72 4,449,583
187 4,449,584
248 4,449,585
303 4,449,586
323 4,449,587

CLASS 169

48 4,449,588
4,449,589

CLASS 172

126 4,449,590
195 4,449,591

CLASS 174

27 4,450,317
84 R 4,450,318

CLASS 175

52 4,449,592
58 4,449,593
59 4,449,594
79 4,449,595
85 4,449,596

CLASS 177

256 4,449,597

CLASS 179

1.5 M 4,450,321
2 EA 4,450,319
5 R 4,450,320
146 E 4,450,322

CLASS 180

6.5 4,449,598
8.1 4,449,599
132 4,449,600
148 4,449,601
215 4,449,602
232 4,449,603
233 4,449,604
287 4,449,605
297 4,449,606

CLASS 181

213 4,449,607
228 4,449,608
230 4,449,609
243 4,449,610

CLASS 182

63 4,449,611
92 4,449,612

CLASS 184

1.5 4,449,613

CLASS 187

9 R 4,449,614

CLASS 188

67 4,449,615
71.8 4,449,616

CLASS 192

0.033 4,449,617
0.052 4,449,619
4,449,620
3.31 4,449,618
70.13 4,449,621
84 C 4,449,622

CLASS 198

335 4,449,623
412 4,449,624
472 4,449,625
765 4,449,626
847 4,449,627

CLASS 200

1 V 4,450,323
5 A 4,450,324
52 R 4,450,325
61.45 M 4,450,326
144 B 4,450,327
144 R 4,450,328
148 A 4,450,329
4,450,330
160 4,450,331
340 4,450,332

CLASS 201

20 4,450,046

CLASS 203

15 4,450,047

CLASS 204

4,450,048
35 N 4,450,049
41 4,450,050
43 T 4,450,051
51 4,450,052
67 4,450,053
4,450,054
78 4,450,055
98 4,450,056
4,450,057
B1 54,065,366
145 R 4,450,058
157.1 R B1 3,869,362
158 R 4,450,059
268 4,450,060
286 4,450,061
298 4,450,062
400 4,450,063
412 4,450,064
4,450,065

CLASS 206

45.18 4,449,628
45.19 4,449,629
369 4,449,630
459 4,449,631
540 4,449,632
612 4,449,633

CLASS 208

8 LE 4,450,066
86 4,450,067
251 H 4,450,068
255 4,450,069

CLASS 209

3 4,450,070
144 4,450,071
170 4,450,072
564 4,450,073

CLASS 210

96.1 4,450,074
223 4,450,075
242.1 4,450,076
275 4,450,077
315 4,450,078
391 4,450,080
445 4,450,081
660 4,450,082

CLASS 212

196 4,449,634
4,449,635

CLASS 215

11 E 4,449,636
21 4,449,637
211 4,449,638
224 4,449,639

CLASS 219

10.49 R 4,450,333
10.55 C 4,450,335
10.55 E 4,450,334
69 M 4,450,336
4,450,337
78.12 4,450,338
124.34 4,450,339
132 4,450,340
137.52 4,450,341
216 4,450,342
357 4,450,343
400 4,450,344
491 4,450,345
522 4,450,346
549 4,450,347

CLASS 220

270 4,449,640
306 4,449,641

CLASS 221

211 4,449,642
226 4,449,643

CLASS 222

3 4,449,644
49 4,449,645
95 4,449,646
153 4,449,647
164 4,449,648
181 4,449,649
309 4,449,650
455 4,449,651

CLASS 223

46 4,449,652

CLASS 224

35 4,449,653
148 4,449,654
153 4,449,655
320 4,449,656
329 4,449,657

CLASS 226

138 4,449,658
190 4,449,659

CLASS 227

8 4,449,660
155 4,449,661

CLASS 229

49 4,449,662

CLASS 232

35 4,449,663

CLASS 235

380 4,450,348
462 4,450,349
467 4,450,350

CLASS 236

49 4,449,664

CLASS 238

10 R 4,449,665
84 4,449,666

CLASS 239

167 4,449,667
230 4,449,668
533.1 4,449,669

CLASS 241

35 4,449,670
36 4,449,671
101.7 4,449,672
186 R 4,449,673
245 4,449,674

CLASS 242

56.2 4,449,675
198 4,449,676
199 4,449,677

CLASS 244

12.5 4,449,678
118.2 4,449,679
130 4,449,680
4,449,681
4,449,682
4,449,683
160 4,449,684

CLASS 246

8 4,449,685

CLASS 248

215 4,449,686
225.2 4,449,687
498 4,449,688
544 4,449,689

CLASS 249

85 4,449,690

CLASS 250

221 4,450,351
223 R 4,450,352
231 R 4,450,353
256 4,450,354
310 4,450,355
339 4,450,356
356 ML 4,450,357
492.1 4,450,358
572 4,450,359

CLASS 251

85 4,449,691
144 4,449,692
149.8 4,449,693
171 4,449,694
214 4,449,695
231 4,449,696

CLASS 252

8.55 D 4,450,084
8.6 4,450,083
8.75 4,450,085
32.7 E 4,450,096
62.51 4,450,086
73 4,450,087
75 4,450,088
95 4,450,089
106 4,450,090
174.21 4,450,091
181 4,450,092
182 4,450,093
299.61 4,450,094
315.2 4,450,095
404 4,450,097
518 4,450,100
522 R 4,450,101
542 4,450,102

CLASS 254

297 4,449,697

CLASS 260

112 B 4,450,104
112 R 4,450,103
4,450,154
112.5 R 4,450,105
124 R 4,450,106
239.3 P Re.31,587
243.3 4,450,108
4,450,109
349 4,450,110
369 4,450,111
410.9 R 4,450,112
439 R 4,450,113
440 4,450,360
458 C 4,450,114
465 E 4,450,115
502.5 E 4,450,116

CLASS 261

39 A 4,450,117
44 D 4,450,119
147 4,450,118

CLASS 264

3 R 4,450,124
4.7 4,450,123
13 4,450,125
31 4,450,120
4,450,121
41 4,450,126
46.4 4,450,122
56 4,450,127
70 4,450,128
132 4,450,129
154 4,450,130
209.2 4,450,131
328.8 4,450,132
336 4,450,133

CLASS 266

48 4,449,698
58 4,449,699
79 4,449,700
218 4,449,701

CLASS 267

64.12 4,449,702

CLASS 269

71 4,449,703
88 4,449,704

CLASS 271

9 4,449,705
290 4,449,706

CLASS 272

109 4,449,716

CLASS 273

171 4,449,707
186 A 4,449,708
248 4,449,709
249 4,449,710
256 4,449,711
326 4,449,712

CLASS 277

1 4,449,713
9 4,449,714
12 4,449,715
153 4,449,717
170 4,449,718
192 4,449,719
207 A 4,449,720
221 4,449,721

CLASS 279

62 4,449,722

CLASS 280

5 C 4,449,724
5 H 4,449,723
78 4,449,725
81 A 4,449,726
91 4,449,727
605 4,449,729
625 4,449,730
632 4,449,731
644 4,449,732
707 4,449,733
731 4,449,728
766.1 4,449,734
818 4,449,735

CLASS 285

3 4,449,736
7 4,449,737
11 4,449,738
14 4,449,739
149 4,449,740
153 4,449,741
236 4,449,742

CLASS 290

1 R 4,450,361
40 C 4,450,363
55 4,450,362
4,450,364

CLASS 294

11 4,449,743
87.2 4,449,744
88 4,449,745

CLASS 296

1 R 4,449,746
97 E 4,449,747
183 4,449,748
194 4,449,749

CLASS 297

188 4,449,750
284 4,449,751
341 4,449,752

CLASS 299

2 4,449,753
21 4,449,754
31 4,449,755

CLASS 301

37 P 4,449,756

CLASS 303

6 C 4,449,757
38 4,449,759

CLASS 305

12 4,449,758

CLASS 307

262 4,450,365
297 4,450,366
4,450,367
362 4,450,368
450 4,450,369
475 4,450,370
4,450,371
511 4,450,372

CLASS 310

51 4,450,373
313 B 4,450,374
331 4,450,375
334 4,450,376
348 4,450,377
361 4,450,378

CLASS 312

42 4,449,760
116 4,449,761
196 4,449,762
208 4,449,763
236 4,449,764
311 4,449,765
348 4,449,766

CLASS 313

477 HC 4,450,379
485 4,450,380
579 4,450,381

CLASS 315

082 4,450,382
106 4,450,383
127 4,450,384
205 4,450,385
371 4,450,386
375 4,450,387

CLASS 318

87 4,450,388
140 4,450,389
282 4,450,390
313 4,450,391
317 4,450,392
592 4,450,393
696 4,450,394
700 4,450,395
721 4,450,396
762 4,450,397
803 4,450,398
814 4,450,399

CLASS 320

2 4,450,400
22 4,450,401

CLASS 324

73 R 4,450,402
166 4,450,403
226 4,450,404
234 4,450,405
247 4,450,406
304 4,450,407
318 4,450,408
460 4,450,409

CLASS 328

155 4,450,410

CLASS 330

2 4,450,411
255 4,450,412
279 4,450,413
288 4,450,414

CLASS 331

111 4,450,415
117 FE 4,450,416

CLASS 333

24 R 4,450,417
128 4,450,418
164 4,450,419
194 4,450,420
202 4,450,421
4,450,422

CLASS 335

131 4,450,423

CLASS 336

94 4,450,424

CLASS 337

171 4,450,425

CLASS 338

21 4,450,426
32 H 4,450,427
34 4,450,428
35 4,450,429

CLASS 339

14 R 4,449,768
17 C 4,449,769
17 CF 4,449,770
17 LC 4,449,767
19 4,449,771
29 B 4,449,772
59 M 4,449,773
4,449,774
75 MP 4,449,775
91 R 4,449,776
103 R 4,449,777
143 R 4,449,778
177 R 4,449,779

CLASS 340

58 4,450,431
146.2 4,450,432
347 DA 4,450,433
506 4,450,434
511 4,450,435
531 4,450,436
540 4,450,437
576 4,450,438
703 4,450,439
753 4,450,440
773 4,450,441
814 4,450,442
870.36 4,450,443
904 4,450,430

CLASS 343

5 CM 4,450,444
7.5 4,450,445
7.7 4,450,446
17.7 4,450,447
379 4,450,448
700 MS 4,450,449
758 4,450,450
765 4,450,451

CLASS 346

108 4,450,453
135.1 4,450,452
140 PQ 4,450,455
140 R 4,450,454
4,450,456
4,450,457
155 4,450,458
160 4,450,459

CLASS 350

1.1 4,449,780
3.61 4,449,785
96.15 4,449,781
96.16 4,449,782
4,449,783
96.21 4,449,784
289 4,449,788
293 4,449,786
319 4,449,789
357 4,449,790
427 4,449,791
432 4,449,792
458 4,449,793
472 4,449,794
516 4,449,795
538 4,449,787
582 4,449,796

CLASS 351

205 4,449,797
207 4,449,798

CLASS 353

39 4,449,799
119 4,449,800

CLASS 354

12 4,449,801
105 4,449,805
121 4,449,806
195.1 4,449,807
416 4,449,802
4,449,803
418 4,449,804

CLASS 355

3 DD 4,449,810
3 DR 4,449,809
3 SH 4,449,811
3 TR 4,449,808
14 R 4,449,813
14 SH 4,449,812
75 4,450,536
85 4,449,814
106 4,449,815
110 B1 4,265,533

CLASS 356

37 4,449,816
145 4,449,817
227 4,449,822
237 4,449,818
300 4,449,819
307 4,449,820
319 4,449,821
346 4,449,823
349 4,449,825
350 4,449,824

CLASS 387

17 4,450,460
19 4,450,461
23 4,450,462
30 4,450,463
4,450,464
4,450,465
4,450,466
38 4,450,467
51 4,450,468
56 4,450,469
59 4,450,470
80 4,450,471
82 4,450,472

CLASS 358

10 4,450,473
19 4,450,474
44 4,450,475
74 4,450,476
86 4,450,477
111 4,450,478
113 4,450,479
114 4,450,481
149 4,450,480
160 4,450,482
166 4,450,483
213 4,450,484
298 4,450,485
299 4,450,486
335 4,450,487
342 4,450,488
348 4,450,489

CLASS 360

13 4,450,490
96.5 4,450,491
105 4,450,492
106 4,450,493
125 4,450,494
137 4,450,495

CLASS 361

58 4,450,496
82 4,450,497
212 4,450,498
253 4,450,499
277 4,450,500
284 4,450,501
309 4,450,502
356 4,450,503
369 4,450,504
386 4,450,505

CLASS 362

4 4,450,506
61 4,450,507
105 4,450,508
216 4,450,509
221 4,450,510
267 4,450,511
276 4,450,512
299 4,450,513

CLASS 363

37 4,450,514
60 4,450,515
84 4,450,516
124 4,450,517

CLASS 364

183 4,450,518
200 4,450,519
4,450,520
4,450,521
4,450,522
4,450,523
4,450,524
4,450,525
405 4,450,526
415 4,450,527
431.05 4,450,528
508 4,450,529
513 4,450,530
604 4,450,531
703 4,450,532
724 4,450,533
900 4,450,534
4,450,535

CLASS 365

217 4,450,537
219 4,450,538

CLASS 366

13 4,449,826
85 B1 3,195,868
131 4,449,827
147 4,449,828

CLASS 367

35 4,450,539
41 4,450,540
149 4,450,541
150 4,450,542
154 4,450,543
176 4,450,544
198 4,450,545

CLASS 368

63 4,449,829
119 4,449,830
165 4,449,831
187 4,449,832
262 4,449,833

CLASS 369

24 4,450,546
45 4,450,547
71 4,450,548
75.1 4,450,549
126 4,450,550
173 4,450,551
240 4,450,552
275 4,450,553

CLASS 370

4 4,450,554
31 4,450,555
58 4,450,556
4,450,557
106 4,450,558

CLASS 371

10 4,450,559
25 4,450,560
37 4,450,561
51 4,450,562

CLASS 372

23 4,450,563
26 4,450,564
32 4,450,565
38 4,450,566
50 4,450,567
76 4,450,568

CLASS 373

9 4,450,569
69 4,450,570

CLASS 375

7 4,450,571
87 4,450,572
104 4,450,573

CLASS 376

262 4,450,134

CLASS 377

2 4,450,574

CLASS 378

26 4,450,575
47 4,450,576
109 4,450,577
152 4,450,578

CLASS 382

8 4,450,579

CLASS 383

6 4,450,580
42 4,450,581

CLASS 384

99 4,449,834

CLASS 400

124 4,449,836
161 4,449,835
208 4,449,837
234 4,449,838
485 4,449,839

CLASS 402

34 4,449,840

CLASS 403

24 4,449,841
25 4,449,842
173 4,449,843

CLASS 404

60 4,449,844
118 4,449,845

CLASS 405

7 4,449,846
19 4,449,847
50 4,449,848
52 4,449,849
60 4,449,850
93 4,449,851
168 4,449,852
184 4,449,853
195 4,449,854
260 4,449,855
269 4,449,856
286 4,449,857
4,449,858
291 4,449,859
293 4,449,860

CLASS 406

39 4,449,861
93 4,449,862
182 4,449,863

CLASS 407

113 4,449,864

CLASS 408

1 R 4,449,865
9 4,449,866
103 4,449,867
138 4,449,868

CLASS 409

11 4,449,869
134 4,449,870
178 4,449,871
252 4,449,872

CLASS 410

80 4,449,875
151 4,449,876

CLASS 411

57 4,449,877
341 4,449,873
418 4,449,874
495 4,449,878

CLASS 414

11 4,449,879
421 4,449,880
428 4,449,881
665 4,449,882
744 A 4,449,883
749 4,449,884
750 4,449,885
776 4,449,886

CLASS 415

4 4,449,887
143 4,449,888

CLASS 416

16 4,449,889

CLASS 417

50 4,449,890
240 4,449,892
322 4,449,893
328 4,449,894
368 4,449,895
399 4,449,896
423 R 4,449,891
437 4,449,897

CLASS 418

61 B 4,449,898
255 4,449,899

CLASS 419

12 4,450,135

CLASS 420

590 4,450,136

CLASS 422

12 4,450,137
4,450,138
186.3 4,450,139
225 4,450,141

CLASS 423

8 4,450,142
10 4,450,143
54 4,450,144
242 4,450,145
304 4,450,146
4,450,147
605 4,450,148

CLASS 424

1.1 4,450,149
4,450,150
46 4,450,151
70 4,450,152
94 4,450,153
177 4,450,155
180 4,450,156
200 4,450,157
220 4,450,158
238 4,450,107
246 4,450,159
250 4,450,160
251 4,450,161
4,450,162
253 4,450,163
256 4,450,164
258 4,450,165
4,450,166
4,450,167
267 4,450,168
270 4,450,169
273 R 4,450,170
279 4,450,171
309 4,450,172
4,450,173
329 4,450,174
349 4,450,175

CLASS 425

6 4,449,900
4,449,901
7 4,449,902
38 4,449,903
97 4,449,904
117 4,449,905
131.1 4,449,906
149 4,449,917
174.4 4,449,916
183 4,449,907
204 4,449,908
296 4,449,909
325 4,449,910
374 4,449,911
444 4,449,912
548 4,449,913
556 4,449,914
564 4,449,915

CLASS 426

2 4,450,176
19 4,450,177
69 4,450,178
103 4,450,179
107 4,450,180
507 4,450,181
565 4,450,182
646 4,450,183

CLASS 427

34 4,450,184
39 4,450,185
42 4,450,186
125 4,450,187
217 4,450,188
236 4,450,189
304 4,450,190
443.1 4,450,191

CLASS 428

40 4,450,192
71 4,450,193
172 4,450,194
178 4,450,195
197 4,450,196
232 4,450,197
315.5 4,450,198
317.9 4,450,199
323 4,450,200
336 4,450,201
412 4,450,202
514 4,450,203
552 4,450,204
4,450,205
606 4,450,206
614 4,450,207
620 4,450,208
626 4,450,209
660 4,450,210

CLASS 429

27 4,450,211
35 4,450,212
105 4,450,213
194 4,450,214

CLASS 430

7 4,450,215
31 4,450,216
58 4,450,217
59 4,450,218
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102 4,450,220
106.6 4,450,221
213 4,450,224
220 4,450,222
223 4,450,223
300 4,450,226
339 4,450,227
505 4,450,228
523 4,450,229
539 4,450,230
567 4,450,225

CLASS 431

76 4,449,918
4,449,919
91 4,449,920

CLASS 432

8 4,449,921
64 4,449,922
82 4,449,923
138 4,449,924
225 4,449,925

CLASS 433

32 4,449,926
38 4,449,927
40 4,449,928
56 4,449,929
64 4,449,930
74 4,449,931
126 4,449,932
141 4,449,933
143 4,449,934
151 4,449,935
214 4,449,936
225 4,449,937

CLASS 434

12 4,449,939
66 4,449,940
153 4,449,941
224 4,449,942
334 4,449,943

CLASS 435

7 4,450,231
15 4,450,232
178 4,450,233
253 4,450,234
4,450,235
4,450,236
4,450,237
256 4,450,238

CLASS 436

510 4,450,239

CLASS 440

47 4,449,944
53 4,449,945

CLASS 441

4 4,449,946
81 4,449,947

CLASS 445

18 4,449,948
24 4,449,949
28 4,449,950
34 4,449,951
55 4,449,952

CLASS 455

12 4,450,582
86 4,450,583
135 4,450,585
161 4,450,586
182 4,450,587
192 4,450,588
205 4,450,589
214 4,450,590
325 4,450,584

CLASS 464

19 4,449,953
36 4,449,954
78 4,449,955
149 4,449,956

CLASS 474

14 4,449,957
205 4,449,958
238 4,449,959
242 4,449,960

CLASS 493

209 4,449,962
414 4,449,963

CLASS 494

16 4,449,964
4,449,965
20 4,449,966
54 4,449,967

CLASS 501

136 4,450,240

CLASS 502

34 4,450,241
105 4,450,242
107 4,450,098
131 4,450,243
150 4,450,302
185 4,450,244
211 4,450,245
232 4,450,099

CLASS 521

129 4,450,246

CLASS 523

116 4,449,938
518 4,450,247

CLASS 524

99 4,450,248
132 4,450,249
141 4,450,250
251 4,450,251
265 4,450,266
353 4,450,252
378 4,450,253
399 4,450,254
430 4,450,255

CLASS 525

316 4,450,256
437 4,450,257
440 4,450,258

CLASS 526

173 4,450,259
213 4,450,260
214 4,450,261
234 4,450,262
249 4,450,263
279 4,450,264
298 4,450,265

CLASS 528

99 4,450,267
327 4,450,268

CLASS 544

8 4,450,269
24 4,450,270
354 4,450,271
357 4,450,272

CLASS 546

37 4,450,273
262 4,450,274

CLASS 548

201 4,450,275
303 4,450,276
342 Re.31,588
346 4,450,277
376 4,450,278

CLASS 549

27 4,450,279
221 4,450,280
255 4,450,281

CLASS 556

472 4,450,282
479 4,450,283

CLASS 560

163 4,450,284
206 4,450,285
241 4,450,286
4,450,287
4,450,288
4,450,289
246 4,450,290

CLASS 562

463 4,450,292
530 4,450,291
579 4,450,293
608 4,450,294

CLASS 564

294 4,450,295

CLASS 568

316 4,450,296
424 4,450,297
437 4,450,298
454 4,450,299
462 4,450,300
473 4,450,301
574 4,450,303
609 4,450,304
611 4,450,305
630 4,450,306
637 4,450,308
665 4,450,307

CLASS 570

217 4,450,309

CLASS 585

400 4,450,310
413 4,450,311
481 4,450,312
624 4,450,313
640 4,449,961

CLASS 604

24 4,449,968
51 4,449,534
54 4,449,971
96 4,449,972
152 4,450,079
161 4,449,973
175 4,449,974
179 4,449,975
254 4,449,976
319 4,449,984
322 4,449,969
333 4,449,970
366 4,449,977
372 4,449,978
379 4,449,979
890 4,449,980
4,449,981
891 4,449,982
892 4,449,983

CLASSIFICATION OF DESIGNS

D2—	186	273,910		201	273,926		434	273,942		9	273,957			273,974		33	273,989
D3—	71	273,911	D7—	1	273,927	D10—	6	273,943			273,958			273,975		45	273,990
		273,912		38	273,928		50	273,944	D16—	26	273,959		26	273,972		46	273,991
	76	273,913		76	273,929		65	273,945		132	273,960	D23—	2	273,976		99	273,992
D4—	12	273,914		137	273,930		96	273,946	D19—	90	273,961			273,977			273,993
D6—	3	273,915		351	273,931	D12—	127	273,947	D21—	57	273,962		58	273,978	D25—	48	273,994
	26	273,916	D8—	30	273,933		181	273,948		81	273,963			273,979			273,995
	30	273,917		70	273,934		317	273,949		104	273,964		61	273,980		68	273,996
	31	273,918		303	273,935	D14—	1	273,950		207	273,965	D24—	3	273,983		75	273,997
	32	273,919			273,936		5	273,951		221	273,968		02	273,981		91	273,998
	48	273,920		330	273,932		58	273,954		237	273,966			273,982	D26—	3	273,999
	57	273,921		344	273,937		60	273,909		246	273,967		10	273,984		29	274,000
	66	273,922		396	273,938			273,955	D22—	13	273,969		16	273,985		35	274,001
	166	273,923	D9—	301	273,939		66	273,952			273,970		17	273,986		42	274,002
	188	273,924		337	273,940		111	273,953			273,971			273,987		85	274,003
	196	273,925		420	273,941	D15—	5	273,956		25	273,973		31	273,988			

CLASSIFICATION OF PLANTS

P—	68	5,235		5,236		74	5,234	

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PATENTS

1 :	4,450,160	4,449,886	4,450,503	4,449,473	4,449,741	4,449,837
4 :	4,449,260	4,449,888	4,450,508	4,449,524	4,449,772	4,450,241
6 :	4,449,412	4,449,901	4,450,527	4,449,538	4,449,784	4,450,381
	4,449,561	4,449,929	4,450,556	4,449,570	4,449,817	4,450,569
	4,449,690	4,449,933	4,450,560	4,449,572	4,449,833	22 : 4,449,257
	4,450,064	4,449,938	4,450,567	4,449,588	4,449,873	4,449,324
	4,450,537	4,449,939	4,450,568	4,449,643	4,449,945	4,449,479
01 :	4,449,480	4,449,941	4,450,582	4,449,649	4,449,948	4,449,991
	4,449,527	4,449,944	4,016,750	4,449,666	4,449,969	4,450,069
	4,450,054	4,449,958	08 : 4,449,592	4,449,746	4,449,979	4,450,260
	4,450,063	4,449,965	4,449,595	4,449,760	4,449,984	23 : 4,449,340
04 :	4,449,747	4,449,966	4,449,753	4,449,844	4,450,022	4,449,770
	4,449,762	4,449,973	4,449,823	4,449,878	4,450,026	24 : 4,449,329
	4,449,845	4,449,983	4,449,896	4,450,060	4,450,028	4,449,363
	4,449,930	4,450,002	4,450,027	4,450,072	4,450,092	4,449,469
	4,450,202	4,450,015	4,450,144	4,450,110	4,450,141	4,449,472
	4,450,374	4,450,021	4,450,231	4,450,291	4,450,173	4,449,547
	4,450,445	4,450,029	4,450,387	4,450,409	4,450,183	4,449,660
	4,287,739	4,450,034	4,450,411	4,450,414	4,450,203	4,449,675
05 :	4,449,542	4,450,041	09 : 4,449,302	4,450,435	4,450,239	4,449,881
	4,449,644	4,450,062	4,449,312	4,450,480	4,450,251	4,450,148
	4,449,686	4,450,079	4,449,336	4,450,583	4,450,284	4,450,192
	4,450,529	4,450,080	4,449,359	13 : 4,449,261	4,450,362	4,450,246
06 :	4,449,253	4,450,082	4,449,446	4,449,296	4,450,375	4,450,446
	4,449,262	4,450,103	4,449,548	4,449,434	4,450,386	4,450,478
	4,449,264	4,450,104	4,449,629	4,449,488	4,450,434	4,450,483
	4,449,271	4,450,126	4,449,693	4,449,626	4,450,498	4,450,563
	4,449,283	4,450,129	4,449,714	4,449,761	4,450,510	25 : 4,449,254
	4,449,323	4,450,198	4,449,830	4,449,847	4,450,512	4,449,295
	4,449,403	4,450,278	4,449,875	4,449,876	3,994,221	4,449,311
	4,449,407	4,450,281	4,449,990	4,449,893	18 : 4,449,290	4,449,353
	4,449,426	4,450,315	4,450,037	4,449,908	4,449,318	4,449,373
	4,449,441	4,450,322	4,450,056	4,449,968	4,449,328	4,449,463
	4,449,514	4,450,325	4,450,113	4,450,073	4,449,409	4,449,464
	4,449,536	4,450,338	4,450,134	15 : 4,449,894	4,449,422	4,449,477
	4,449,564	4,450,356	4,450,136	17 : 4,449,300	4,449,497	4,449,824
	4,449,582	4,450,365	4,450,145	4,449,338	4,450,007	4,449,885
	4,449,596	4,450,368	4,450,146	4,449,352	4,450,131	4,449,926
	4,449,605	4,450,384	4,450,237	4,449,368	4,450,270	4,449,932
	4,449,615	4,450,402	4,450,351	4,449,384	4,450,394	4,449,950
	4,449,628	4,450,407	4,450,415	4,449,394	4,450,476	4,449,989
	4,449,636	4,450,418	4,450,430	4,449,436	4,450,548	4,450,033
	4,449,652	4,450,437	4,450,534	4,449,439	4,450,587	4,450,039
	4,449,655	4,450,443	4,450,558	4,449,442	19 : 4,449,343	4,450,133
	4,449,665	4,450,444	4,450,574	4,449,581	4,449,510	4,450,135
	4,449,673	4,450,447	10 : 4,450,112	4,449,585	4,449,511	4,450,190
	4,449,703	4,450,459	4,450,172	4,449,586	4,449,734	4,450,213
	4,449,704	4,450,463	4,450,226	4,449,590	4,449,758	4,450,319
	4,449,771	4,450,472	12 : 4,449,259	4,449,602	4,450,417	4,450,324
	4,449,776	4,450,488	4,449,265	4,449,633	4,450,507	4,450,331
	4,449,801	4,450,489	4,449,297	4,449,709	20 : 4,449,589	4,450,334
	4,449,857	4,450,493	4,449,315	4,449,712	21 : 4,449,437	4,450,358
	4,449,867	4,450,496	4,449,465	4,449,719	4,449,540	4,450,380

4,450,385
4,450,396
4,450,410
4,450,436
4,450,451
4,450,572
26 : 4,449,267
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4,449,334
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28 : 4,449,391
29 : 4,449,313
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30 : 4,449,481
4,450,193
31 : 4,449,252
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32 : 4,449,559
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34 : 4,449,280
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35 : 4,449,256
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36 : Re.31,588
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4,449,375
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37 : 4,449,272
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38 : 4,449,462
4,449,672
39 : Re.31,589
4,449,348
4,449,370
4,449,398
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4,449,640
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4,449,670
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4,450,059
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DESIGN PATENTS

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